Brocade DCX 8510-4 Backbone

Hardware Reference Manual

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Brocade Communications Systems, Incorporated

Document History

Title	Publication number	Summary of changes	Date
Brocade DCX 8510-4 Backbone Hardware Reference Manual	53-1002177-01	New document.	April 2011

Title	Publication number	Summary of changes	Date
Brocade DCX 8510-4 Backbone Hardware Reference Manual	53-1002177-02	Updated filler panel graphics, CP replacement procedures to 7.0, data transmission range information, and rack kit measurement.	June 2011
Brocade DCX 8510-4 Backbone Hardware Reference Manual	53-1002177-03	Updated power supply requirements data, power supply replacement information, ISL trunking totals, inter-chassis link information, and CP blade slot numbering.	July 2011
Brocade DCX 8510-4 Backbone Hardware Reference Manual	53-1002177-04	Added new blades, FC8-32E, FC8-48E and enhanced ICL capability.	December 2011
Brocade DCX 8510-4 Backbone Hardware Reference Manual	53-1002177-05	Added Preparing for WWN card replacement section. Corrected CR16-4 core blade power draw.	May 2012

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About This Document

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How this document is organized

This document is a hardware reference manual written for system administrators and technicians experienced with networking, Fibre Channel, and SAN technologies to help them install, set up, configure, operate, maintain, and troubleshoot the Brocade DCX 8510-4 Backbone ("Brocade DCX 8510-4").

This document presents information on setting up and operating the Brocade DCX 8510-4. It is organized in a loosely chronological order, beginning with an overview of the Brocade DCX 8510-4 and ending with removal and replacement procedures of field-replaceable units (FRUs).

The document contains the following sections:

- Chapter 1, "Brocade DCX 8510-4 Backbone Overview," identifies the components of the Brocade DCX 8510-4 and provides a brief description of its features.

- Chapter 2, "Installation of the Brocade DCX 8510-4," describes how to install, set up, and power on the Brocade DCX 8510-4.

- Chapter 3, "Logging In and Configuring the Brocade DCX 8510-4," provides the initial configuration information required to get the Brocade DCX 8510-4 established in a fabric.

- Chapter 4, "Monitoring System Components," provides descriptions of the LEDs and their functions, and also lists Fabric OS commands required for monitoring the Brocade DCX 8510-4.

- Chapter 5, "Removal and Replacement Procedures," describes how to remove and replace each of the FRUs in the Brocade DCX 8510-4.

- Appendix A, "Specifications," provides information on the physical characteristics, environmental requirements, and regulatory certifications for the Brocade DCX 8510-4.

- Appendix B, "Application and Encryption Blades," provides information about application blades that are optionally available for the Brocade DCX 8510-4.

- Appendix C, "Diagnostics and Troubleshooting," provides methods for receiving system-wide or component-level status and interpreting POST and boot activities and diagnostic tests; it also includes troubleshooting tips.
- Appendix D, "Port Numbering Template," contains templates where you can record the port numbering sequence for the port blades.

Supported hardware and software

This document includes information specific to the Brocade DCX 8510-4 running Brocade Fabric OS version 7.0.0 and later.

What's new in this document

The following information has been added:

- Corrected maximum power draw for CR16-4 core blade. Refer to "Power demands per component."

Document conventions

This section describes text formatting conventions and important notice formats used in this document.

Text formatting

The narrative-text formatting conventions that are used in this document are as follows:

bold text	Identifies command names
	Identifies GUI elements
	Identifies keywords and operands
	Identifies text to enter at the GUI or CLI
italic text	Provides emphasis
	Identifies variables
	Identifies paths and Internet addresses
	Identifies document titles
`code` text	Identifies CLI output
	Identifies syntax examples

For readability, command names in the narrative portions of this guide are presented in mixed lettercase: for example, **switchShow**. In actual examples, command lettercase is often all lowercase. Otherwise, this manual specifically notes those cases in which a command is case-sensitive.

Command syntax conventions

Command syntax in this manual follows these conventions:

command	Commands are printed in bold.
--**option, option**	Command options are printed in bold.
-**argument,** arg	Arguments.
[ ]	Optional element.
variable	Variables are printed in italics. In the help pages, values are <u>underlined</u> or enclosed in angled brackets < >.
...	Repeat the previous element, for example "member[;member...]"
value	Fixed values following arguments are printed in plain font. For example, --**show** WWN
|	Boolean. Elements are exclusive. Example: --**show** -**mode** egress | ingress

Command examples

This book describes how to perform configuration tasks using the Fabric OS command line interface, but does not describe the commands in detail. For complete descriptions of all Fabric OS commands, including syntax, operand description, and sample output, refer to the *Fabric OS Command Reference*.

Notes, cautions, and warnings

The following notices and statements are used in this manual. They are listed below in order of increasing severity of potential hazards.

NOTE
A note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates potential damage to hardware or data.

> ⚠️ **CAUTION**
>
> **A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.**

> 🔺 **DANGER**
>
> *A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.*

Notice to the reader

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These references are made for informational purposes only.

Corporation	Referenced Trademarks and Products
Microsoft Corporation	Windows, Windows NT, Internet Explorer
Sun Microsystems, Inc.	Sun, Solaris
Netscape Communications Corporation	Netscape
Red Hat, Inc.	Red Hat, Red Hat Network, Maximum RPM, Linux Undercover
Velcro Industries B.V.	Velcro

Additional information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

Brocade resources

To get up-to-the-minute information, go to *http://my.brocade.com* to register at no cost for a user ID and password.

White papers, online demonstrations, and data sheets are available through the Brocade website at:

http://www.brocade.com/products-solutions/products/index.page

For additional Brocade documentation, visit the Brocade website:

http://www.brocade.com

Release notes are available on the MyBrocade website and are also bundled with the Fabric OS firmware.

Other industry resources

For additional resource information, visit the Technical Committee T11 website. This website provides interface standards for high-performance and mass storage applications for Fibre Channel, storage management, and other applications:

http://www.t11.org

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association website:

http://www.fibrechannel.org

Getting technical help

Contact your Brocade DCX 8510-4 supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

1. General information

   - Technical Support contract number, if applicable
   - Model name
   - Operating system version
   - Error numbers and messages received
   - **supportSave** command output
   - Detailed description of the problem and specific questions
   - Description of any troubleshooting steps already performed and results
   - Serial console and Telnet session logs
   - syslog message logs

2. Brocade DCX 8510-4 serial number

   The Brocade DCX 8510-4 serial number (Switch Serial No.) and corresponding bar code are provided on the serial number label, as shown here:

   FT00X0054E9

   The serial number label is located on the port side of the chassis, on the lower right side and directly above the cable management comb.

In addition, the **chassisShow** command displays the Brocade DCX 8510-4 serial number, as well as information about the port and application blades, and other field-replaceable units (FRUs).

3. License ID

    Use the **licenseIdShow** command to display the license ID.

4. World Wide Name (WWN)

    Use the **wwn** command to display the switch WWN.

    If you cannot use the **wwn** command because the switch is inoperable, you can get the WWN from the same place as the serial number, except for the Brocade DCX 8510-4. For the Brocade DCX 8510-4, access the numbers on the WWN cards by removing the Brocade logo plate at the top of the nonport side of the chassis.

Document feedback

Because quality is our first concern at Brocade, we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to:

documentation@brocade.com

Provide the title and version number and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Brocade DCX 8510-4 Backbone Overview

In this chapter

Brocade DCX 8510-4 features

The Brocade DCX 8510-4 is part of Brocade's industry-leading Backbone-class product line, a highly robust class of network switching platform that combines breakthrough performance, scalability, and energy efficiency with long-term investment. Brocade 8510 Backbones are the industry's most powerful Fibre Channel switching infrastructure, providing the most reliable, scalable, high performance foundation for private cloud storage and highly virtualized environments. They are designed to increase business agility by adapting to dynamic growth and change, providing high availability access to information, and reducing infrastructure and administrative costs.

Key features of the Brocade DCX 8510-4 include:

- Up to 192 16 Gbps external ports in a single chassis, enabling high density SAN configurations with reduced footprint.

- Support for 2, 4, 8, and 16 Gbps auto-sensing Fibre Channel ports. Trunking technology groups up to eight ports to create high performance 128-Gbps ISL trunks between switches.

- The Brocade DCX 8510-4 also supports 10 Gbps FC-type SFPs in 16 Gbps port blades only and also supports 10 GbE SFPs in the FX8-24 application blade. The two types of SFPs are not interchangeable.

- The 10 Gbps ports can be configured manually on only the first eight ports of the 16 Gbps port blades.

- Support for many of the application, port blade, and control processor (CP) blades supported in the Brocade 8510-4 (with the exception of the Core Switch Blade), thereby providing flexible system configurations and fewer types of new blades.

- Beginning with Fabric OS v7.0.1, up to nine chassis can be connected with the use of 4x16 Gbps quad SFP (QSFP) inter-chassis links (ICLs). Fabric OS v7.0.0 permits up to six chassis to be linked.

- Support for high-performance port blades running at 2, 4, 8, 10, or 16 Gbps, enabling flexible system configuration.

- Redundant and hot-swappable control processor and core switch blades, power supplies, blower assemblies, and WWN cards that enable a high availability platform and enable nondisruptive software upgrades for mission-critical SAN applications.

- Universal ports that self-configure as E_Ports, F_Ports, EX_Ports and M_Ports (mirror ports). 10 Gbps ports are E_Ports only.

- Diagnostic port (D_Port) functionality.

- In-flight data cryptographic (encryption/decryption) and data compression capabilities through the 16 Gbps port blades.

- Fibre Channel over IP (FCIP) functionality through the FX8-24 blade.

Brocade DCX 8510-4 hardware components

The Brocade DCX 8510-4 features a modular and scalable mechanical construction that allows a wide range of flexibility in installation, fabric design, and maintenance. The chassis can be mounted with the cables facing the front of the equipment rack or to the rear, and consists of the following:

- Up to four hot-swappable port blade assemblies that can be configured in a single chassis, delivering up to 192 16 Gbps Fibre Channel ports.

- Two slots for control processor blades (CP8):
    - A single active CP8 blade can control all 192 ports in the chassis.
    - The standby CP8 blade assumes control of the Brocade DCX 8510-4 if the active CP fails.

- Two slots for core switch blades (CR16-4):
    - CR16-4 blade interconnects all port blades.
    - Inter-chassis link (ICL) connectors to connect to as many as nine neighboring chassis under Fabric OS v7.0.1. Six chassis can be connected under Fabric OS v7.0.0.
    - Both CR16-4 blades are active.

- Modular, hot-swappable port blades:
    - 64-port, 8-Gbps blades (FC8-64)
    - 32-port, 8-Gbps blades (FC8-32E)
    - 48-port, 8-Gbps blades (FC8-48E)
    - 32-port, 16-Gbps blades (FC16-32)
    - 48-port, 16-Gbps blades (FC16-48)

- Modular, hot-swappable application blades:
    - FX8-24: 24-port (12 FC, 10 GbE, 2 10GbE) FCIP extension blade enabling long distance communication over existing IP infrastructure.

- Modular, hot-swappable encryption blades:
  - FS8-18: 16-port, up to 4 blades per chassis, supporting in-flight data cryptographic (encryption/decryption) and data-compression capabilities.
- Modular, hot-swappable field-replaceable units (FRUs):
  - Two blower assemblies.
  - Two power supplies (100-240 VAC auto-sensing).
    - ❑ At 110 VAC (nominal): A minimum of two power supplies is required, regardless of the number of port or application blades. This configuration does not support high availability.
    - ❑ 220 VAC (nominal) is recommended for efficiency. A second power supply is required to support high availability.
    - ❑ Redundant AC primary power connections ensure high availability. Each power supply has its own connector, so the number of primary power connections is two for optimum efficiency and redundancy.
  - Two WWN cards.
  - Blades use small form-factor pluggable (SFP+ and mSFP) optical transceivers. SFP+ and mSFP transceivers support speeds of 2, 4, 8, 10, or 16 Gbps.

    NOTE
    The 8-Gbps SFP+s and mSFPs auto-negotiate at 2, 4, and 8 Gbps. The 16-Gbps SFP+s auto-negotiate at 4, 8, and 16 Gbps. The 10 Gbps speeds must be manually set and require special 10 Gbps SFP+ transceivers.

  - QSFP-based inter-chassis link (ICL) cabling running at 64 Gbps (four 16 Gbps clustered in a single quad connector and cable).
- Blades that are serviced from the port side of the Brocade DCX 8510-4. Blowers, power supplies, and power cables that are serviced from the nonport side.
- World Wide Name (WWN) cards on the nonport side, with WWN status LEDs located under the bezel.
- Two vertical cable management finger assemblies and a redesigned chassis door for improved cable management.

Port side of the Brocade DCX 8510-4

NOTE
Airflow in the Brocade DCX 8510-4 is from the nonport side to the left side and port side of the chassis (viewed from the port side) and out the exhaust vents. If you use the Port Side Exhaust Kit, the air vents are all on the port side of the chassis (see Figure 2).

Figure 1 displays a sample configuration of the port side of the Brocade DCX 8510-4.
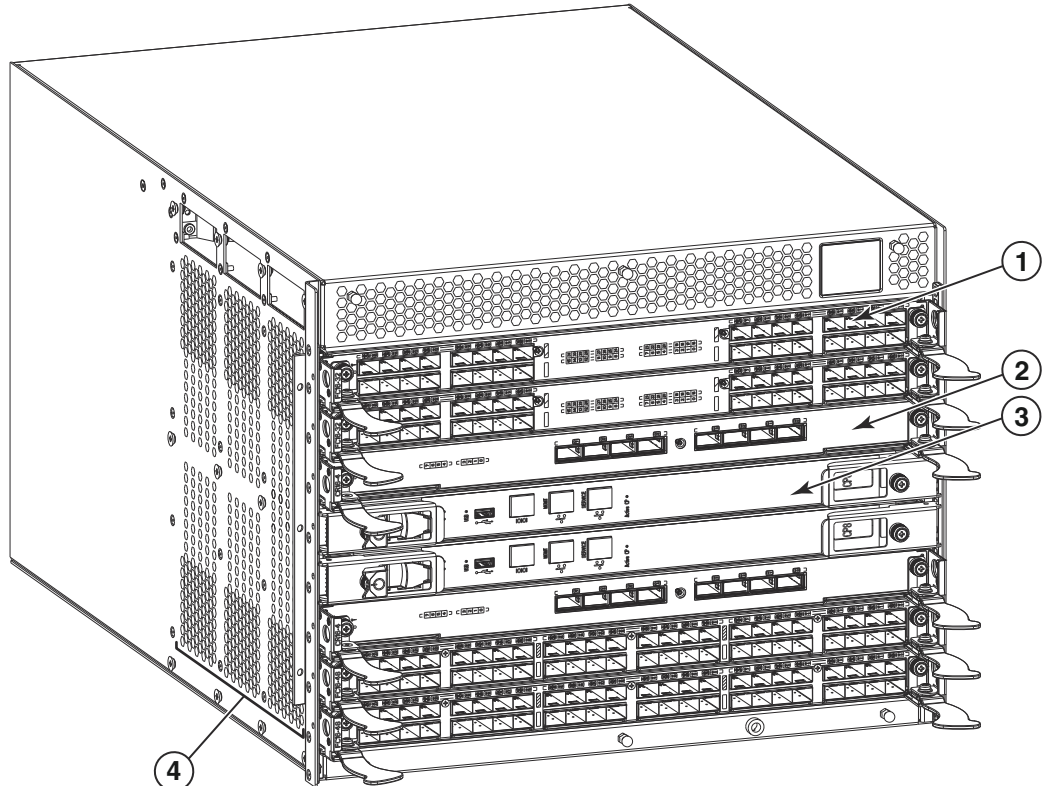
1	Port blade (FC16-32)	3	Control processor blade (CP8)
2	Core switch blade (CR16-4)	4	Exhaust vent

FIGURE 1   **Port side of the Brocade DCX 8510-4 (sample configuration)**
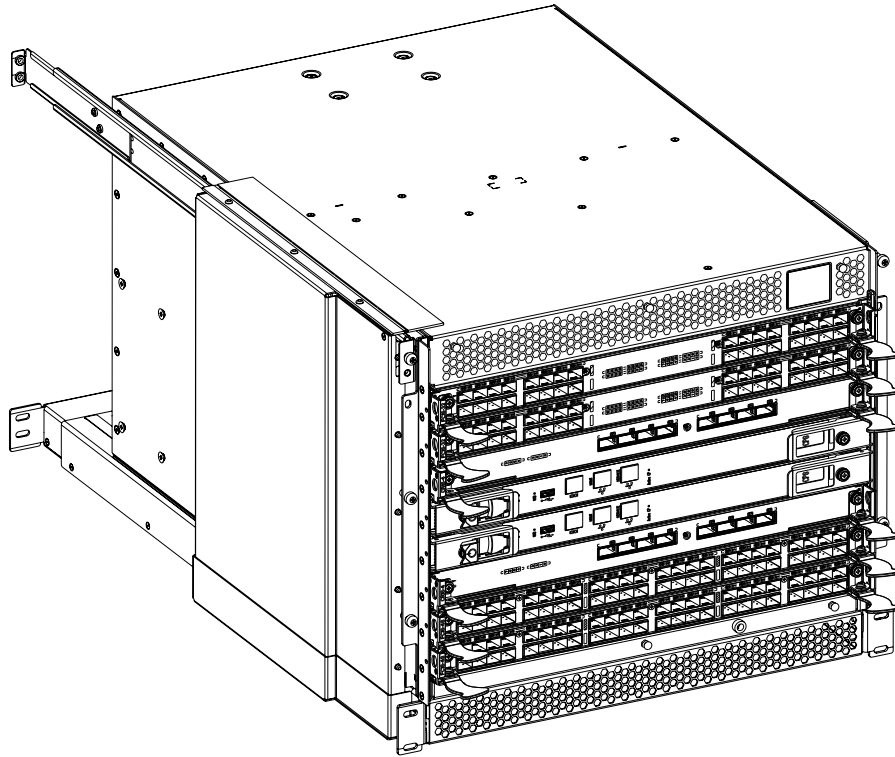
FIGURE 2 Port side of the Brocade DCX 8510-4 with the port side exhaust kit installed (sample configuration)

Nonport side of the Brocade DCX 8510-4

Figure 3 displays a sample configuration of the nonport side view of the Brocade DCX 8510-4.
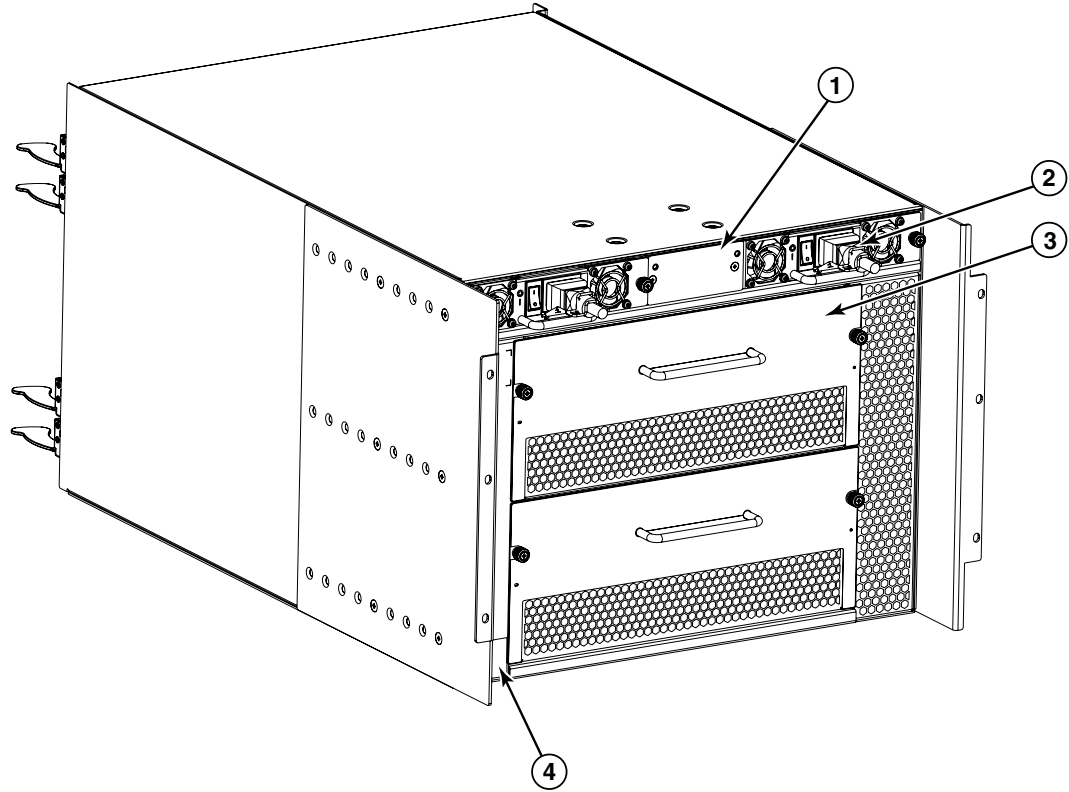
1	WWN card bezel (logo plate)	3	Blower assembly (2x)
2	Power supply (2x)	4	Label with serial number and WWN

FIGURE 3   Nonport side of the Brocade DCX 8510-4 (sample configuration)

Brocade DCX 8510-4 blades

Table 1 summarizes the port, application, control processor, and core switch blades that are available for the Brocade DCX 8510-4.

TABLE 1   Blades available for the Brocade DCX 8510-4

Description	Name	Function
Brocade DCX 8510-4 control processor blade	CP8	The CP8 blade contains the control plane for the chassis. There are two CP8 blades for redundancy. This control processor blade is compatible with the Brocade DCX 8510-8, Brocade DCX 8510-4, Brocade DCX, and Brocade DCX-4S.
Brocade DCX 8510-4 core switch blade	CR16-4	The CR16-4 blade contains the ASICs for switching between port blades. Every port blade connects to each core switch blade. There can be up to 192 16 Gbps (256 8 Gbps) total ports for port blades. Each core switch blade connects to 128 backplane ports. Core switch blades have additional front port connectivity to connect multiple chassis and backplane connections for the storage server blade. This core switch blade is compatible only with the Brocade DCX 8510-4.
64-port 8-Gbps port blade	FC8-64	A 64-port Brocade port blade supporting 2, 4, and 8 Gbps port speeds with mSFPs. This port blade is compatible with the Brocade DCX 8510-8, Brocade DCX 8510-4, Brocade DCX, and Brocade DCX-4S.
32-port 8-Gbps port blade	FC8-32E	A 32-port Brocade port blade supporting 2, 4, and 8 Gbps Fibre Channel port speeds. This port blade is compatible with the Brocade DCX 8510-8 and Brocade DCX 8510-4. This blade requires Fabric OS v7.0.1 or later to run in this chassis.
48-port 8-Gbps port blade	FC8-48E	A 48-port Brocade port blade supporting 2, 4, and 8 Gbps Fibre Channel port speeds. This port blade is compatible with the Brocade DCX 8510-8 and Brocade DCX 8510-4. This blade requires Fabric OS v7.0.1 or later to run in this chassis.
32-port 16-Gbps port blade	FC16-32	A 32-port Brocade port blade supporting 2, 4, 8, 10, and 16 Gbps Fibre Channel port speeds. The blade also supports port-based in-flight encryption/decryption and compression/decompression. This port blade is compatible with the Brocade DCX 8510-8 and Brocade DCX 8510-4.
48-port 16-Gbps port blade	FC16-48	A 48-port Brocade port blade supporting 2, 4, 8, 10, and 16 Gbps Fibre Channel port speeds. The blade also supports port-based in-flight encryption/decryption and compression/decompression. This port blade is compatible with the Brocade DCX 8510-8 and Brocade DCX 8510-4.
Storage encryption blade	FS8-18	The FS8-18 blade enables data cryptographic (encryption/decryption) and data-compression capabilities for data-at-rest. It has 16 Fibre Channel optical SFP ports. This application blade is compatible with the Brocade DCX 8510-8, Brocade DCX 8510-4, Brocade DCX, and Brocade DCX-4S.
FCIP extension blade	FX8-24	The FX8-24 blade enables FCIP functionality over existing IP infrastructure. It has 12 FC ports, ten 1 GbE ports, and two 10 GbE ports available. This application blade is compatible with the Brocade DCX 8510-8, Brocade DCX 8510-4, Brocade DCX, and Brocade DCX-4S.

High availability

The following features contribute to the Brocade DCX 8510-4 high-availability design:

- Redundant, hot-swappable FRUs, including blades, power supplies, blowers, and WWN cards
- Enhanced data integrity on all data paths
- Fabric Shortest Path First (FSPF) rerouting around failed links
- Integration with Simple Network Management Protocol (SNMP) managers
- Automatic control processor failover
- Nondisruptive "hot" software code loads and activation
- Easy configuration, save, and restore

The high-availability software architecture of the Brocade DCX 8510-4 provides a common framework for all applications that reside on the system, allowing global and local states to be maintained through any component failure. High-availability elements consist of the High Availability Manager, the heartbeat, the fault/health framework, the replicated database, initialization, and software upgrade.

The High Availability Manager controls access to the standby control processor, facilitates software upgrades, prevents extraneous CP failover activity, closes and flushes streams, provides flow control and message buffering, and supports a centralized active and standby state.

Reliability

The Brocade DCX 8510-4 uses the following error detection and correction mechanisms to ensure reliability of data:

- Error Detection and Correction over main control processor memory.
- Error Detection and Correction mechanism, which checks for encoder errors and fault isolation (EDFI), such as cyclic redundancy checking (CRC), parity checking, checksum, and illegal address checking.
- Power-on self-test (POST).
- Dual control processors that enable hot, nondisruptive fast firmware upgrades.
- One serial port and two Ethernet ports (on each control processor) for management and for service. Offline control processor diagnostics and remote diagnostics simplify troubleshooting. The standby control processor monitors diagnostics to ensure the system is operational should a failover be necessary.
- Bus monitoring and control of blades and other field-replaceable units (FRUs).

Serviceability

The Brocade DCX 8510-4 provides the following features to enhance and ensure serviceability:

- Modular design with hot-swappable components.
- Flash memory that stores two firmware images per control processor.
- USB port on control processor blades for most tasks that formerly required an FTP/SCP server, including software and firmware upgrades.
- Nonvolatile random-access memory (NVRAM), containing the OEM serial number, Brocade serial number, revision information, and part number information.
- Background health-check daemon.
- Memory scrubber, self test, and bus ping to determine if a bus is not functioning.
- RASlog messages.
- SMI-S compliant.
- Hardware and software watchdog timers.
- Status LEDs.
- Predictive diagnostics analysis through Fabric Watch.
- SNMP (including version 3) integration with higher-layer managers.
- Cable management using vertical finger assemblies to accommodate the horizontal orientation of the blades.

Software features

The Fabric OS allows any Fibre Channel-compliant device to attach to the switches as long as it conforms to the device login, name service, and related Fibre Channel standards. Each operating environment requires that a Fibre Channel host bus adapter (HBA) be available with a standards-compliant driver for correct interface to the fabric.

Fabric OS consists of a set of embedded applications running on top of an embedded Linux operating system kernel. Some of these applications include:

- Name server
- Alias server
- Zone server
- Simple Network Management Protocol (SNMP) agent
- SMI-S compliant API
- Syslog auditing
- RCS (Reliable Commit Service)
- NTP
- Tasks to manage address assignment, routing, link initialization, fabric initialization, link shutdown, Brocade DCX 8510-4 shutdown, and the user interface

Security

The following list highlights some of the key security features available for the Brocade DCX 8510-4 and for other Brocade enterprise-class products running Fabric OS 7.0.1 or later. For details, contact your Brocade DCX 8510-4 supplier and refer to the Brocade White Paper, "The Growing Need for Security in Storage Area Networks."

- DH-CHAP
- SSHv2 (using AES, 3DES, RSA)
- HTTPS (using AES)
- SNPMv3
- FC-SP
- Secure RPC
- Secure file copy (SCP)
- Telnet disable
- Telnet timeout
- IP filters (block listeners)
- Secure passwords (centralized control through RADIUS/CHAP)
- Multiple user accounts (MUAs). Up to 255.
- Role-based access controls (RBACs)
- Administrative domains/Virtual fabrics
- Boot PROM password reset
- Password hardening policies
- Up front login in Web Tools
- Login banner
- Monitoring of attempted security breaches (through audit logging)
- Monitoring of attempted security breaches (through Fabric Watch Security Class)
- Fibre Channel security policies: DCC and SCC
- Trusted Switch (FCS) for central security management
- Management access controls (SNMPv3, Telnet, FTP, serial port, front panel)
- Hardware-enforced zoning by WWN, domain/port ID, or both
- Default zoning
- RSCN suppression and aggregation
- Configurable RSCN suppression by port
- NTPv3 (to synchronize timestamps)
- Event auditing
- Change tracking
- Firmware change alerts in Fabric Manager
- Persistent port disable
- Persistent domain ID
- E_Port disable

Network manageability

The Brocade DCX 8510-4 has a single domain and is managed as a single element with the Brocade Network Advisor. The Brocade DCX 8510-4 responds to its own IP address and appears as a separate entity to the Telnet protocol and SNMP.

All management interfaces, such as Telnet, Web Tools, standards-compliant SMI-S, and Management Server, support a "port N within blade M" naming scheme.

The Brocade DCX 8510-4 supports SNMPv1 and SNPMv3. When SNMP devices send SNMP messages to a management console running SAN management software, the information is stored in a management information base (MIB). Fabric OS v7.0.0 and later supports the latest Fibre Alliance Fibre Channel Management (FCMGMT) and Storage Management Initiative (SMI) MIBs, which allow common information necessary for management software to provide information to a SAN administrator. Refer to the *Fabric OS MIB Reference* for additional MIB information.

Installation of the Brocade DCX 8510-4

In this chapter

Time and items required

You can set up and install the Brocade DCX 8510-4 in the following ways:

- As a standalone unit on a flat surface.

- In a 19-in. Electronic Industries Association (EIA) cabinet, using a Brocade DCX 8510-4, DCX-4S Rack Mount Kit (either a 27-31 in. or 18-34 in. kit depending on rack used).

- In a chassis with the Port Side Exhaust Kit (provided) in an approved rack.

- In a mid-mount telecommunications (Telco) rack, using the Mid-Mount Rack Kit available from your Brocade DCX 8510-4 supplier.

This chapter describes how to set up the Brocade DCX 8510-4 as a standalone unit. For rack-mount installation instructions, refer to the appropriate manual as described in the following table.

Table 2 describes the main installation and setup tasks, the estimated time required for each, and the items required to complete the task based on a fully populated Brocade DCX 8510-4 (192 Fibre Channel ports using the FC16-48 port blades). Configurations with fewer ports require less time. These time estimates assume a prepared installation site and appropriate power and network connectivity.

TABLE 2 Installation tasks, time, and items required

Installation task	Time estimate	Items required
Site preparation and unpacking Brocade DCX 8510-4	30 minutes	1/2-in. socket wrench (to remove pallet bolts). #2 Phillips screwdriver (for cable management comb). Pallet jack. Hydraulic lift or assisted lift, able to raise to a minimum of 140 cm (55 in.), with a minimum capacity of 113 kg (250 lb). The Brocade DCX 8510-4 weighs 68 kg (150 lb) with four FC16-48 port cards installed (192 ports).
Installing rack mount kit or port side exhaust kit	30 minutes	Refer to the one or more of the following if you are mounting the Brocade DCX 8510-4 in a rack: *Brocade Port Side Exhaust Kit Installation Procedure* *Brocade DCX 8510-4, DCX-4S Mid-Mount Rack Kit Installation Procedure* or *Brocade DCX 8510-4, DCX-4S Rack Kit Installation Procedure.*
Mounting and securing Brocade DCX 8510-4 in rack	30 minutes	
Installing power cables and powering on the Brocade DCX 8510-4	20 minutes	Power cables (provided in the Brocade DCX 8510-4 accessory kit).
Establishing serial connection, logging on to Brocade DCX 8510-4, and configuring IP addresses	20 minutes	Serial cable (provided in the accessory kit). Workstation computer with a serial port or terminal server port and a terminal emulator application (such as HyperTerminal). Ethernet IP addresses for the Brocade DCX 8510-4 chassis and for both control processor blades: total three addresses.
Installing an Ethernet cable, opening a Telnet session, and configuring the Brocade DCX 8510-4 domain ID, date and time, and additional system parameters. Verify and back up configuration.	20 minutes	Ethernet cabling (optional) for Telnet access. Refer to the *Fabric OS Administrator's Guide*.
Installing transceivers as needed	20 minutes (longer if using high-density port blades)	SFP+, mSFP, and QSFP optical transceivers as needed.
Attaching fiber-optic cables, cable ties, and cable guides	2-3 hours	Fiber-optic cables, cable ties, and cable comb.

Preparing for Brocade DCX 8510-4 installation

NOTE
Read the safety notices before installation ("Safety notices").
Read "Power specifications" to plan for meeting power supply standards before installing the chassis.
Read "Managing cables" to plan for cable management.

The following steps are required to ensure correct installation and operation.

1.

   Plan to install the Brocade DCX 8510-4 with the nonport side facing the air-intake aisle. The Brocade DCX 8510-4 can be installed facing either direction, if serviceability and cooling requirements are met.

2. Ensure that dedicated electrical branch circuits with the following characteristics are available:

   NOTE
   Refer to "Power specifications" on page 114 for specific requirements depending on your chassis configuration.

   - 200–240 VAC, 50–60 Hz (branch circuits) - recommended for high availability and maximum blade usage when configured with 192 10 Gbps ports (circuits highly recommendedrequired for high availability if configured with 384 10 Gbps ports) Other port totals
   - 110-120 VAC, 50-60 Hz (four branch circuits highly recommended)
   - cables for 200 - 240 VAC service; up to cables for 110 - 120 VAC service
   - Protected by a circuit breaker in accordance with local electrical codes
   - Supply circuit, line fusing, and wire size adequate to the electrical rating on the chassis nameplate
   - Location close to the chassis and easily accessible
   - Grounded outlets installed by a licensed electrician and compatible with the power cords

   ATTENTION
   To maximize fault tolerance, connect each power cord to a separate power source.

3. Plan for cable management before installing the chassis.

   Cables can be managed in a variety of ways, such as by routing cables below the chassis, to either side of the chassis, through cable channels on the sides of the cabinet, or by using patch panels.

4. Ensure that the following is available for configuration of the Brocade DCX 8510-4:

   - Workstation with an installed terminal emulator, such as HyperTerminal
   - Serial cable (provided)
   - Three Ethernet cables (including one spare)
   - Access to an FTP server for backing up the switch configuration or collecting **supportsave** output data (optional)
   - A Brocade USB stick for collecting **supportsave** output data (optional)
   - Transceivers (copper and optical) and compatible cables

5. Ensure that the air intake and exhaust vents have a minimum of 5.1 cm (2 in.) of airspace.

6. Ensure that the air temperature on the air intake side is less than 40°C (104°F) during operation.

Unpacking and installing the Brocade DCX 8510-4

Use the following procedure to unpack and install your Brocade DCX 8510-4.

CAUTION

Use safe lifting practices when moving the product. (C015)

NOTE
A fully populated Brocade DCX 8510-4 (four FC16-48 port cards, 192 ports) weighs approximately 68 kg (150 lbs) and requires a hydraulic or assisted lift to install it.

1. Unpack the Brocade DCX 8510-4.

   a. Cut the bands that encircle the packaging.

   b. Remove the lid and the kits and foam from the top of the chassis.

   c. Lift the cardboard box off the chassis and remove the plastic bag from around the chassis. Save the packing materials for use when returning the old chassis.

   d. Leave the chassis on top of the plastic shipping tray if the chassis must be transported to the installation location.

   NOTE
   The Brocade DCX 8510-4 packaging does not incorporate a wood pallet and pallet brackets. The chassis sits on top of a plastic shipping tray.

2. Use a pallet jack or other assisted lift to transport the new chassis to the installation area. Doorways must be wider than 36 in. (91 cm) to accommodate the chassis.

3. Remove the Brocade DCX 8510-4 port side exhaust kit (if ordered), accessory kit, packing foam, and antistatic plastic from the chassis and set aside.

4. Remove the chassis door from the Brocade DCX 8510-4.

5. Remove the vertical cable management fingers.

6. Use a lift to raise the chassis to the correct level. If installing the chassis in a cabinet, follow the instructions provided by the rack kit manufacturer.

7. If applicable, lock the wheels of the lift.

8. Gently slide the chassis onto the final installation surface, ensuring that it remains supported during the transfer.

9. Ensure that the chassis is oriented so that the nonport side has access to intake air (cool).

10. Reinstall the vertical cable management fingers.

11. Reinstall the door. The door must be installed to meet EMI compliance.

Items included with the Brocade DCX 8510-4

The Brocade DCX 8510-4 ships with the following:

- Brocade DCX 8510-4 chassis, populated with:
  - Control processor blades (CP8)
  - Core switch blades (CR16-4)
  - Port blades, application blades, and encryption blades (included based on customer specification)
  - Blade slot filler panels (for slots not filled by blades)
  - Port side exhaust kit (included based on customer specification)
  - WWN cards
  - WWN bezel (logo plate)
  - Power supplies
  - Power supply filler panel (included if there is only one power supply)
  - Blower assemblies
  - Cable management finger assemblies
  - Chassis door
- Accessory kit containing the following items:
  - *Brocade DCX 8510-4 Backbone QuickStart Guide*
  - Brocade Documentation CD (contains documents related to the Brocade DCX 8510-4)
  - ESD grounding strap
  - USB device
  - RS-232 serial cable. The RS-232 cable has an adapter at one end that can be removed to provide an RJ45-style connector.
- Brocade DCX 8510-4, DCX-4S rack mount kit with instructions

Order the Brocade-branded optical transceivers (SFP+, mSFP, and QSFP). The Brocade DCX 8510-4 supports SWL, LWL, and ELWL transceivers. The mSFPs and QSFPs are SWL transceivers only.

NOTE
For information about the SFP+, mSFP, and QSFP transceivers that are qualified for the Brocade DCX 8510-4, go to
http://www.brocade.com/downloads/documents/matrices/Brocade_Compatibility_Matrix.pdf.

Providing power to the Brocade DCX 8510-4

Complete the following steps to provide power to the chassis.

⚠ **DANGER**

Use the supplied power cords. Ensure the facility power receptacle is the correct type, supplies the required voltage, and is properly grounded. (D004)

1. Connect the two AC power cords to the two power supplies.

2. Connect the power cords to a power source with voltage of 200 to 240 VAC, 47 to 63 Hz or optionally to a power source with voltage of 110 to 120 VAC, 47 to 63 Hz. If using any application blades in the chassis, the 200 to 240 VAC option is necessary in order to achieve power supply redundancy.

    ATTENTION
    Use of the high-voltage line (200 to 240 VAC) is highly recommended because of better power-conversion efficiency.
    For a fully-loaded DCX 8510-4, 200 to 240 VAC is required for high availability (ability to hot swap a failed power supply without affecting system operation).

3. Switch the AC power switches on the power supplies to **I**. The AC power switches light green when switched on and power is supplied.

4. The Brocade DCX 8510-4 performs a power-on self-test (POST) each time it is powered on. POST takes approximately 10 minutes and is complete when the indicator light activity displays the operational state.

    You can bypass POST by using the **fastBoot** command. You can also disable POST for successive reboots on the Brocade DCX 8510-4 using the **diagDisablePost** command.

    ATTENTION
    Do not connect the switch to the network until the IP addresses are configured.

    For information about LED patterns, see Chapter 4, "Monitoring System Components".

Port numbering

The Brocade DCX 8510-4 uses the following port numbering method (Appendix D, "Port Numbering Template"). The "bottom" of the blade is the right end as you look at them installed in a Brocade DCX 8510-4 chassis.

*   FC8-64 port blade — Ports are numbered from 0 through 31 from right to left on the lower set of ports and 32 through 63 from right to left on the upper set of ports. Trunking groups are permitted with up to eight ports per group. Trunking groups are as follows: 0-7, 8-15, 16-23, 24-31, 32-39, 40-47, 48-55, and 56-63.

*   FC8-32E port blade — Ports are numbered from 0 through 15 from right to left on the lower set of ports and 16 through 31 from right to left on the upper set of ports.

*   FC8-48E port blade — Ports are numbered from 0 through 23 from right to left on the lower set of ports and 24 through 47 from right to left on the upper set of ports.

- FC16-32 port blade — Ports are numbered from 0 through 15 from right to left on the lower set of ports and 16 through 31 from right to left on the upper set of ports.

- FC16-48 port blade — Ports are numbered from 0 through 23 from right to left on the lower set of ports and 24 through 47 from right to left on the upper set of ports.

- CR16-4 core blade — Inter-chassis link connectors are numbered from 0 through 7 from right to left. Each connector is actually a group of four 16 Gbps ports.

- FS8-18 blade — The 16 physical Fibre Channel ports on this blade are numbered 0 through 15 from right to left. The two 10/100/1000 BaseT ports are numbered from the bottom as GE0 and GE1.

- FX8-24 blade — Ports are numbered in groups. The FC ports are numbered from 0 through 11 in two horizontal rows of six ports starting from the lower right and upper right in the right-hand group of 12 ports. They are labeled FC on the front panel diagram. The two 10GbE ports are 0 and 1 and are in the lower row just to the left of the FC ports. They are labeled 10GE on the front panel diagram. The GbE ports are numbered 0 through 9 and are in both rows to the left of the FC and 10GE ports. They are labeled GE on the front panel diagram. Up to three FC trunking groups are permitted. The three groups are defined as follows:

  - Trunk group 0: FC ports 0, 1

  - Trunk group 1: FC ports 6, 7

  - Trunk group 2: FC ports 2, 3, 4, 5, 8, 9, 10, 11

-

For more information on the FC8-64 port blade see . For more information on the front panel diagrams on the FX8-24 application blade, see on page 142.

Chassis slots

Chassis slots are numbered 1 through 8, from left to right when facing the port side of the Brocade DCX 8510-4. Control processor blades (CP8) can be installed only in slots 4 and 5. Core switch blades (CR16-4) can be installed only in slots 3 and 6. The rest of the slots, 1, 2, 7, and 8, can be filled with port, application, or encryption blades. Unused slots must be filled with blade filler panels to maintain adequate cooling.

Cable management

The cable management finger assemblies () are attached to the chassis to either side of the port side of the chassis and allow for simple cable management. The cable management finger assemblies can be installed without service disruption.

Route the cables across in front of the blades to keep LEDs visible. Leave at least one meter of slack for each fiber-optic cable to provide room to remove and replace blades.

ATTENTION
The minimum radius to which a 50 micron cable can be bent under full tensile load is 5.1 cm (2 in.). For a cable under no tensile load, that minimum is 3.0 cm (1.2 in.).

Cables can be organized and managed in a variety of ways, for example, using cable channels on the sides of the cabinet or patch panels to minimize cable management. Following is a list of recommendations:

NOTE
You should not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.

- Plan for rack space required for cable management before installing the switch.

- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the switch, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.

- If you are using Brocade ISL Trunking, consider grouping cables by trunking groups. The cables used in trunking groups must meet specific requirements, as described in the *Fabric OS Administrator's Guide*.

- For easier maintenance, label the fiber-optic cables and record the devices to which they are connected.

- Keep LEDs visible by routing port cables and other cables away from the LEDs.

- Use Velcro® type straps to secure and organize fiber-optic cables.

ATTENTION
Do not route the cables in front of the air exhaust vent, which is located at the top of the port side of the chassis.If you are using the Port Side Exhaust Kit with your Brocade DCX 8510-4, there is also an exhaust vent at the bottom of the port side of the chassis. Use the cable management finger assemblies to keep the cables away from this exhaust vent as well.

ATTENTION

High density cabling

The FC8-64 high density port blade cannot use the standard LC cables because the pitch between optics in the new mini-SFP (mSFP) transceiver is smaller than in standard SFPs. Patch cables and panels can be used to attach standard size cabling to the blade if necessary. Figure 4 illustrates the mSFP to SFP patch cable. Refer to "Best Practices Guide: High Density Cable Management Solutions" (available at *http://www.brocade.com*) for cable management guidelines for high-density port solutions, cable and patch panel part numbers.
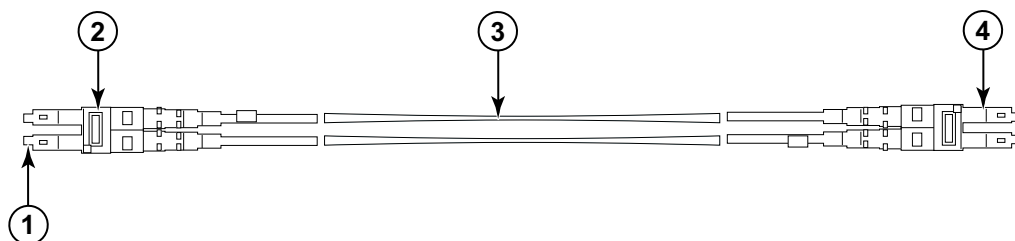
1	mSFP connector	2	1.6 mm cable
3	Duplex clip (black)	4	SFP connector

FIGURE 4   Cable design for the mSFP patch cables for the FC8-64 high density port blade

Note that the duplex clip on the mSFP end of the cable is black for easier recognition. See the appendix for a listing of the qualified mSFP optical cables for the FC8-64 port blade.

If ISL Trunking is in use, group the cables by trunking group. The ports are color-coded to indicate which ports can be used in the same ISL Trunking group: eight ports marked with solid black ovals alternate with eight ports marked with oval outlines.

Refer to Table 22 in Appendix A, "Specifications" for a listing of supported cable speeds and distances.

Installing inter-chassis link (QSFP) cables (optional)

Refer to "Inter-chassis link (QSFP) cable removal and replacement" for the procedure to install the QSFP cables

Logging In and Configuring the Brocade DCX 8510-4

In this chapter

Configuring the Brocade DCX 8510-4

The Brocade DCX 8510-4 must be configured before it is connected to the fabric, and all of the configuration commands must be entered through the active CP blade. The Brocade DCX 8510-4 configuration includes the following parameters:

- IP address and subnet mask for the chassis
- IP addresses, host names, subnet masks, and gateway addresses for both CP blades
- Switch name
- Domain ID for the Brocade DCX 8510-4 (optional)
- WWN for the Brocade DCX 8510-4

The Brocade DCX 8510-4 WWN is initially set by the factory to match the license ID (which is based on the chassis serial number). The WWN can be changed but the license ID cannot be modified.

The configuration information is mirrored to the standby CP blade, which allows the current configuration to remain available even if the active CP blade fails. The configuration information for the Brocade DCX 8510-4 is stored in the WWN cards and the flash memory of the CP blades. The configuration can be backed up to a workstation (uploaded) and then downloaded to the active CP blade if necessary.

NOTE
If the Brocade FS8-18 encryption blade is installed, refer to the *Fabric OS Encryption Administrator's Guide* for the procedures to configure the encryption functions.

Figure 5 illustrates the flow of the basic configuration tasks.

Configuration Tasks

Connect Serial Cable between Switch and Host
↓
Log In to Serial Console Port
↓
Set IP Address
↓
Log Off Serial Console Port and Disconnect Serial Cable
↓
Connect Ethernet Cable and Open Telnet Session
↓
Set Domain ID
↓
Set Date and Time
↓
Install SFPs and Attach Cables
↓
Manage Cables
↓
Verify Operation and Back Up Configuration
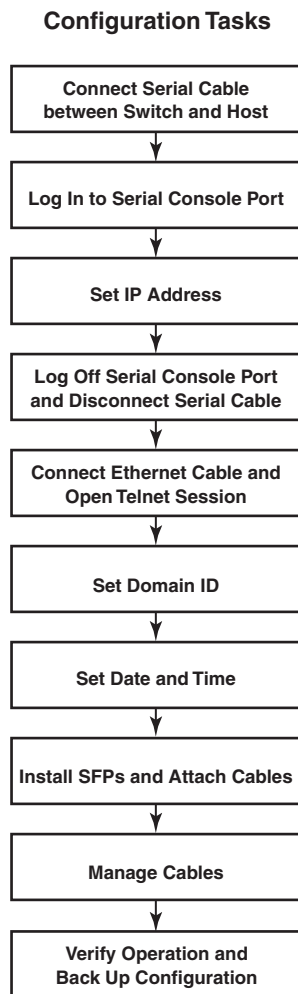
FIGURE 5   Configuration tasks

Establishing a serial connection to the Brocade DCX 8510-4

To establish a serial connection to the console port on the Brocade DCX 8510-4, complete the following steps.

1. Verify that the Brocade DCX 8510-4 is powered on and that POST is complete by verifying that all power LED indicators on the port, control processor, and core switch blades display a steady green light.

2. Remove the shipping cap from the CONSOLE port on the active CP. Use the serial cable provided with the Brocade DCX 8510-4 to connect the CONSOLE port on the active CP to a computer workstation. The active CP blade is indicated by an illuminated (blue) LED.

   ATTENTION
   The CONSOLE port is intended primarily for the initial setting of the IP address and for service purposes.

3. Access the Brocade DCX 8510-4 using a terminal emulator application (such as HyperTerminal in a Windows environment or tip in a UNIX environment).

4. Disable any serial communication programs running on the workstation (such as synchronization programs).

5. Open a terminal emulator application (such as HyperTerminal on a PC, or term, tip, or kermit in a UNIX environment), and configure the application as follows:

   - In a Windows environment:

Parameter	Value
Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

   - In a UNIX environment, enter the following string at the prompt:

     ```
     tip /dev/ttyb -9600
     ```

     If ttyb is already in use, use ttya instead and enter the following string at the prompt:

     ```
     tip /dev/ttya -9600
     ```

   When the terminal emulator application stops reporting information, press **Enter**. You receive the following login prompt:

   ```
   CP0 Console Login:
   ```

6. Proceed to the next task.

Logging in to the serial console port

To log in to the Brocade DCX 8510-4 through the serial connection, follow these steps.

1. Log in to the Brocade DCX 8510-4 as **admin**. The default password is **password**. At the initial login, you are prompted to enter new admin and user passwords. Make sure to write down the new passwords and keep this information in a secure location.

```
Fabric OS (swDir)

swDir login: admin
Password:
Please change your passwords now.
Use Control-C to exit or press 'Enter' key to proceed.

swDir:admin>
```

2. (Optional) Modify passwords. To skip modifying the password, press **Ctrl-C**. For more information on passwords, refer to the *Fabric OS Administrator's Guide*.

> **NOTE**
> Passwords can be 8 to 40 characters long. They must begin with an alphabetic character. They can include numeric characters, the dot (.), and the underscore (_) only. Passwords are case-sensitive, and they are not displayed when you enter them on the command line.
> For more information on passwords, refer to the *Fabric OS Administrator's Guide*.

Configuring the IP addresses

The Brocade DCX 8510-4 requires three IP addresses, which are configured using the **ipAddrSet** command. IP addresses are required for both CP blades (CP0 and CP1) and for the chassis management IP (shown as SWITCH under the **ipAddrShow** command) in the Brocade DCX 8510-4.

> **NOTE**
> The default IP addresses and host names for the Brocade DCX 8510-4 are:
> – 10.77.77.75 / CP0 (the CP blade in slot 4 at the time of configuration)
> – 10.77.77.74 / CP1 (the CP blade in slot 5 at the time of configuration)

> **ATTENTION**
> Resetting an IP address while the Brocade DCX 8510-4 has active IP traffic or has management and monitoring tools running, such as DCFM, Fabric Watch, and SNMP, can cause traffic to be interrupted or stopped.

Complete the following steps to set the IP addresses for the Brocade DCX 8510-4.

1. Log in to the active CP as admin using the serial cable connection.

2. Set up the Brocade DCX 8510-4 IP address by entering the **ipaddrset -chassis** command:

```
swDir:admin> ipAddrSet -chassis
```

Enter the information at the prompts. Specify the **-chassis** IP address. The **-sw 0** IP address is not valid on this chassis.

NOTE
The addresses 10.0.0.0 through 10.0.0.255 are reserved and used internally by the Brocade DCX 8510-4. External IPs must not use these addresses.

3. Set up the CP0 IP address by entering the **ipaddrset -cp 0** command:

```
swDir:admin> ipAddrSet -cp 0
```

Enter the information at the prompts.

4. Set up the CP1 IP address by entering the **ipaddrset -cp 1** command:

```
swDir:admin> ipAddrSet -cp 1
```

Enter the information at the prompts.

This is a sample IP configuration:

```
swDir:admin> ipaddrset -chassis
Ethernet IP Address [0.0.0.0]: 192.168.1.1
Ethernet Subnetmask [0.0.0.0]: 255.255.255.0
Fibre Channel IP Address [0.0.0.0]:
Fibre Channel Subnetmask [0.0.0.0]:
Issuing gratuitous ARP...Done.
Committing configuration...Done.

swDir:admin> ipaddrset -cp 0
Host Name [cp0]:
Ethernet IP Address [10.77.77.75]: 192.168.1.2
Ethernet Subnetmask [0.0.0.0]: 255.255.255.0
Gateway IP Address [0.0.0.0]: 192.168.1.254
IP address is being changed...Done.
Committing configuration...Done.

swDir:admin> ipaddrset -cp 1
Host Name [cp1]:
Ethernet IP Address [10.77.77.74]: 192.168.1.3
Ethernet Subnetmask [0.0.0.0]: 255.255.255.0
Gateway IP Address [0.0.0.0]: 192.168.1.254
IP address of remote CP is being changed...Done.
Committing configuration...Done.
```

Logging off the serial console port and disconnecting the serial cable

You can use the serial port to monitor error messages through the serial connection. If the serial port is no longer required, use the **logout** command to log out of the serial console, remove the serial cable, and replace the plug in the serial port.

Establishing an Ethernet connection to the Brocade DCX 8510-4

After using a serial connection to configure the IP addresses for the Brocade DCX 8510-4, you can connect the active CP blade to the local area network (LAN).

NOTE
Connecting the CP blades to a private network/VLAN is recommended.

By establishing an Ethernet connection, you can complete the Brocade DCX 8510-4 configuration using either a serial session, Telnet, or management applications, such as Web Tools or Brocade Network Advisor.

Perform the following steps to establish an Ethernet connection to the Brocade DCX 8510-4.

1. Remove the shipping plug from the Ethernet port on the active CP blade.

2. Insert one end of an Ethernet cable into the Ethernet port.

3. Connect the other end to an Ethernet 10/100/1000 BaseT LAN.

   The Brocade DCX 8510-4 can be accessed through a remote connection using the command line via Telnet or any of the management tools, such as Web Tools or Brocade Network Advisor.

4. To complete any additional Brocade DCX 8510-4 configuration procedures through a Telnet session, log in to the Brocade DCX 8510-4 by Telnet, using the **admin** login. The default password is **password**.

Customizing a switch name

The switch name of the Brocade DCX 8510-4 can be up to 30 characters long using Fabric OS release 6.3.0 or later; can include letters, numbers, hyphens, and underscore characters; and must begin with a letter.

NOTE
Changing the name causes a domain address format RSCN to be issued.

1. Type **switchName** followed by the new name in double quotes.

   ```
   swDir:admin> switchName "swModularSwitch5"
   Committing configuration...
   Done.
   swModularSwitch5:admin>
   ```

2. Record the new name for reference.

Customizing a chassis name

The chassis name of the Brocade DCX 8510-4 can be up to 15 characters long; can include letters, numbers, hyphens, and underscore characters; and must begin with a letter.

1. Enter **chassisName** followed by the new name in double quotes.

   ```
   switch:admin> chassisname "DCX8510_chassis"
   Committing configuration...
   Done.
   ```

2. Enter **chassisName** by itself to show the name.

    ```
    switch:admin> chassisname
    DCX8510_chassis
    ```

3. Record the new name for reference.

Setting the domain ID

Each switch in the fabric must have a unique domain ID. The domain ID can be manually set through the **configure** command or can be automatically set. The default domain ID for the Brocade DCX 8510-4 is 1. Use the **fabricShow** command to view the already assigned domain IDs.

1. Enter **switchDisable** to disable the Brocade DCX 8510-4.

2. Enter **configure**.

3. Enter **y** at the *Fabric parameters* prompt:

    ```
    Fabric parameters (yes, y, no, n): [no] y
    ```

4. Enter a unique domain ID:

    ```
    Domain: (1.239) [1] 3
    ```

5. Complete the remaining prompts or press **Ctrl+D** to accept the settings and exit.

6. Enter **switchEnable** to re-enable the Brocade DCX 8510-4.

Setting the date and time

The date and time settings are used for logging events. Switch operation does not depend on the date and time; a switch with an incorrect date and time value still functions properly. However, because the date and time are used for logging, error detection, and troubleshooting, they should be set correctly.

Setting the date

To set the date, follow these steps.

1. If necessary, log on to the Brocade DCX 8510-4 by Telnet, using the **admin** account.

    The default password is password.

2. Enter the **date** command, using the following syntax:

    ```
    date "mmddHHMMyy"
    ```

    The values are:

    *   mm is the month; valid values are 01 through 12.
    *   dd is the date; valid values are 01 through 31.

- HH is the hour; valid values are 00 through 23.

- MM is minutes; valid values are 00 through 59.

- yy is the year; valid values are 00 through 99 (values greater than 69 are interpreted as 1970 through 1999, and values less than 70 are interpreted as 2000 through 2069).

```
switch:admin> date
Fri Sep 28 17:01:48 UTC 2010
switch:admin> date "0927123010"
Thu Sep 27 12:30:00 UTC 2010
switch:admin>
```

Setting the time zone

You must perform the procedure on *all* chassis for which the time zone must be set. However, you only need to set the time zone once on each switch, because the value is written to nonvolatile memory.

Use one of the two following procedures to set the time zone.

The following procedure describes how to set the current time zone using timezone_fmt mode to Central Standard time.

1. Log in to the switch using the default password, which is password.

2. Enter the **tsTimeZone** command as follows:

```
switch:admin> tstimezone [--interactive]/ [, timezone_fmt]
```

Use **timezone_fmt** to set the time zone by Country/City or by time zone ID, such as PST.

The following example shows how to change the time zone to US/Central.

```
switch:admin> tstimezone
Time Zone : US/Pacific
switch:admin> tstimezone US/Central
switch:admin> tstimezone
Time Zone : US/Central
```

The following procedure describes how to set the current time zone using interactive mode to Pacific Standard Time.

1. Type the **tsTimeZone** command as follows:

```
switch:admin> tstimezone --interactive
```

2. You are prompted to select a general location.

```
Please identify a location so that time zone rules can be set correctly.
```

3. Enter the appropriate **number** or **Ctrl-D** to quit.

4. At the prompt, select a **country location**.

5. At the prompt, enter the appropriate **number** to specify the time zone region or **Ctrl-D** to quit.

Synchronizing local time

To synchronize the local time of the principal or primary switch with that of an external NTP server, follow these steps.

1. If necessary, log on to the switch by Telnet, using the **admin** account.

2. Enter the **tsClockServer** command:

```
switch:admin> tsclockserver "<ntp1;ntp2>"
```

where *ntp1* is the IP address or DNS name of the first NTP server, which the switch must be able to access. The variable *ntp2* is the second NTP server and is optional. The operand "<ntp1;ntp2>" is optional; by default, this value is LOCL, which uses the local clock of the principal or primary switch as the clock server.

The **tsClockServer** command accepts multiple server addresses in either IPv4, IPv6, or DNS name formats. When multiple NTP server addresses are passed, **tsClockServer** sets the first obtainable address as the active NTP server. The rest will be stored as backup servers that can take over if the active NTP server fails. The principal or primary FCS switch synchronizes its time with the NTP server every 64 seconds.

```
switch:admin> tsclockserver
LOCL
switch:admin> tsclockserver "132.163.135.131"

switch:admin> tsclockserver
132.163.135.131
switch:admin>
```

The following example shows how to set up more than one NTP server using a DNS name:

```
switch:admin> tsclockserver "10.32.170.1;10.32.170.2;ntp.localdomain.net"
Updating Clock Server configuration...done.
Updated with the NTP servers

Changes to the clock server value on the principal or primary FCS switch are
propagated to all switches in the fabric
```

Verifying the PID mode

Before connecting the Brocade DCX 8510-4 to the fabric, verify that the WWN Based persistent port identifier (PID) feature on the Brocade DCX 8510-4 matches the other switches in the fabric. This parameter must be identical for all switches in the fabric and is set using the **configure** command as shown in the following example:

```
switch:admin>configure
Configure...
    Fabric parameters (yes, y, no, n): [no] y
        Domain: (1..239) [1]
        Enable a 256 Area Limit
         (0 = No,
         1 = Zero Based Area Assignment,
         2 = Port Based Area Assignment): (0..2) [0] 1
        WWN Based persistent PID (yes, y, no, n): [no] yes
    <command output truncated>
```

You can check the PID setting using the **configshow** command as in the following example. You can use the | *grep -i pid* qualifier to pinpoint the PID information.

```
switch:admin> configshow | grep -i pid
fabric.ops.mode.pidFormat:1
fabric.wwnPidMode:1
```

The 1 indicates that the WWN Based persistent PID feature is enabled. The default value is 0 for disabled.

Determining installed software licenses

Depending on the vendor agreement, certain licenses are factory installed on the Brocade DCX 8510-4. To determine which licenses are enabled, use the **licenseShow** command.

```
swDir:admin> licenseshow
AAbbccDDeeFFeeGG:
    Web license
    Zoning license
    Extended Fabric license
    Fabric Watch license
    Performance Monitor license
    Trunking license
    Security license
```

In this example, the license key is AAbbccDDeeFFeeGG. Keep a copy of the license key for reference.

The 64-bit chassis ID is required to obtain and activate licenses for the Brocade DCX 8510-4. The chassis ID is available through the **licenseIdShow** command. The **licenseShow** and **licenseIdShow** commands must be entered on the active CP blade. Refer to the *Fabric OS Administrator's Guide* for more information.

Installing transceivers and attaching cables

The following two sets of steps cover the installation of transceivers and cables for most SFPs and for QSFPs.

Installing SFP+ and mSFP transceivers and cables

Complete the following steps to install SFP-type optical transceivers.

NOTE
mSFP transceivers are compatible only with the FC8-64 port blade. While they will fit in other blades, this configuration is unsupported and will generate an error.

The ports are color-coded to indicate which can be used in the same port group for trunking (trunking port groups can be up to eight ports). The ports and cables used in trunking groups must meet specific requirements. Refer to the *Fabric OS Administrator's Guide* for more information.

1. Add the optical transceivers and cables to the Fibre Channel ports.

   The ports are color-coded to indicate which can be used in the same port group for trunking (trunking port groups can be up to 8 ports). The ports and cables used in trunking groups must meet specific requirements. Refer to the *Fabric OS Administrator's Guide*.

2. Position one of the optical transceivers so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

3. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.

4. Repeat steps 1 through 3 for the remaining ports.

5. Organize the cables See "Managing Cables."

6. Verify the Brocade DCX 8510-4 and port status using the **switchShow** command.

7. Verify fabric connectivity using the **fabricShow** command.

Installing QSFP transceivers and cables

Follow these steps to install the QSFPs and cables in the 16 Gbps core blades. These transceivers and cables are used to form the inter-chassis links (ICL) with neighboring DCX 8510 Backbones.

The transceivers should be installed in the blades before connecting the cables.

Because each QSFP contains four 16 Gbps ports, be aware that any problems with one port could affect all four ports in the quad if the QSFP has to be replaced.

1. Position one of the QSFP transceivers so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

   When the transceiver is correctly seated, the status LED will flash amber several times and then turn solid amber.

2. Remove the protective cap from the special QSFP cable and insert it into the transceiver until it is firmly seated.

   The cables are also keyed to fit into the transceivers correctly.

   When the cable is correctly seated, the status LED will change from amber to green.

   Repeat steps 1 and 2 for the remaining ICLs.

3. Organize the cables. See "Managing Cables."

4. Verify the Brocade DCX 8510-4 and connector and port status using the **switchShow -qsfp** command.

A sample of the command output is shown below. The example is from a DCX 8510-4 with a core blade installed in slot 3. Some details for the 8510-8 will be different, but the reported information for the QSFPs will be similar.

Note that the State reported for an unconnected QSFP (shown QSFP 0 and Ports 0-3 below) is No_SigDet. This is different from the State of No_Synch that is reported for regular SFPs that are unconnected.

QSFP 7 (ports 3/28-3/31, Index 748-751) in the following example shows the results for a connected QSFP.

```
switch:FID128:admin> switchshow -qsfp
switchName:     switch name
switchType:     121.3
switchState:    Online
switchMode:     Native
switchRole:     Subordinate
switchDomain:   75
switchId:       fffc4b
switchWwn:      10:00:00:05:1e:4f:eb:00
zoning:         ON (zoning name)
switchBeacon:   OFF
FC Router:      OFF
Allow XISL Use: OFF
LS Attributes:  [FID: 128, Base Switch: No, Default Switch: Yes, Address Mode
0]

Index Slot Port QSFP  Address Media  Speed  State       Proto
===========================================================
256   3    0    0     ------  id     16G    No_SigDet   FC
257   3    1    0     ------  id     16G    No_SigDet   FC
258   3    2    0     ------  id     16G    No_SigDet   FC
259   3    3    0     ------  id     16G    No_SigDet   FC
260   3    4    1     ------  --     16G    No_Module   FC
261   3    5    1     ------  --     16G    No_Module   FC
262   3    6    1     ------  --     16G    No_Module   FC
263   3    7    1     ------  --     16G    No_Module   FC
264   3    8    2     ------  --     16G    No_Module   FC
265   3    9    2     ------  --     16G    No_Module   FC
266   3    10   2     ------  --     16G    No_Module   FC
267   3    11   2     ------  --     16G    No_Module   FC
268   3    12   3     ------  --     16G    No_Module   FC
269   3    13   3     ------  --     16G    No_Module   FC
270   3    14   3     ------  --     16G    No_Module   FC
271   3    15   3     ------  --     16G    No_Module   FC
736   3    16   4     ------  --     16G    No_Module   FC
737   3    17   4     ------  --     16G    No_Module   FC
738   3    18   4     ------  --     16G    No_Module   FC
739   3    19   4     ------  --     16G    No_Module   FC
740   3    20   5     ------  --     16G    No_Module   FC
741   3    21   5     ------  --     16G    No_Module   FC
742   3    22   5     ------  --     16G    No_Module   FC
743   3    23   5     ------  --     16G    No_Module   FC
744   3    24   6     ------  --     16G    No_Module   FC
745   3    25   6     ------  --     16G    No_Module   FC
746   3    26   6     ------  --     16G    No_Module   FC
747   3    27   6     ------  --     16G    No_Module   FC
```

```
748    3   28    7    ------    id    16G    Online      FC   E-Port
10:00:00:05:1e:39:e4:5a trunkmaster name (Trunk master)
749    3   29    7    ------    id    16G    Online      FC   E-Port
10:00:00:05:1e:39:e4:5a trunkmaster name (Trunk master)
750    3   30    7    ------    id    16G    Online      FC   E-Port
10:00:00:05:1e:39:e4:5a trunkmaster name (Trunk master)
751    3   31    7    ------    id    16G    Online      FC   E-Port
10:00:00:05:1e:39:e4:5a trunkmaster name (Trunk master)
```

Managing cables

Cables can be organized and managed in a variety of ways: for example, using cable channels on the port sides of the cabinet or patch panels to minimize cable management. With the horizontal orientation of the blades in the Brocade DCX 8510-4, a pair of vertical cable management finger assemblies have been provided to keep the cables from hanging down in front of other blades.

Following is a list of recommendations:

- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the Brocade DCX 8510-4, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.

- The minimum bend radius should be no smaller than 10x the cable radius. The minimum radius to which a 50 micron cable can be bent under full tensile load is 5.1 cm (2 in.). For a cable under no tensile load, that minimum is 3.0 cm (1.2 in.).

- If ISL Trunking is in use, group the cables by trunking group. The ports are color-coded to indicate which ports can be used in the same ISL Trunking group: eight ports marked with solid black ovals alternate with eight ports marked with oval outlines.

- Generally, Velcro$^{®}$ type cable restraints are recommended to avoid creating sharp bends in the cables. Do not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.

- For easier maintenance, label the fiber optic cables and record the devices to which they are connected.

- Do not route cables in front of the air exhaust vents.

- Route the cables to the sides of the Brocade DCX 8510-4 through the vertical cable management fingers.

- Keep LEDs visible by routing port cables and other cables away from the LEDs.

NOTE
See "Cabling Best Practices" (available at *http://www.brocade.com*) for cable management guidelines.

For the procedure to install the ICL cables, see "Inter-chassis link (QSFP) cable removal and replacement."

Verifying correct operation and backing up the configuration

To verify correct operation and back up the Brocade DCX 8510-4 configuration, follow these steps. For information about LED patterns, see Table 3 on page 48, Table 4 on page 50, and Table 5 on page 52.

Complete the following steps to back up the configuration for the Brocade DCX 8510-4.

1. Check the LEDs to verify that all components are functional.

2. If necessary, log on to the switch by Telnet, using the **admin** account.

3. Verify the correct operation of the Brocade DCX 8510-4 by entering the **switchShow** command from the workstation. This command provides information about switch and port status.

4. Verify the correct operation of the Brocade DCX 8510-4 in the fabric by entering the **fabricShow** command from the workstation. This command provides general information about the fabric.

5. To back up the configuration, run the following two steps:

   a. Enter the **configupload -vf** command. This command uploads the Brocade DCX 8510-4 virtual fabric data.

   b. Enter the **configupload** command. This command uploads the Brocade DCX 8510-4 configuration.

6. You can run the following commands to see additional configuration information that you can copy to a file to save:

   - **configShow**
   - **ipaddrShow**
   - **licenseShow**
   - **switchShow**

   Alternatively, you can save the configuration file to a Brocade USB device by using the **usbstorage** command.

NOTE
Passwords are not saved in the configuration file, and are not uploaded during a configuration upload.

NOTE
It is recommended that the configuration be backed up on a regular basis to ensure that a complete configuration is available for downloading to a replacement Brocade DCX 8510-4.

Powering off the Brocade DCX 8510-4

Perform the following steps to power off the Brocade DCX 8510-4.

1. Shut down the Brocade DCX 8510-4 using the **sysShutdown** command.

```
switch::admin> sysshutdown
This command will shutdown the operating systems on your switch.
You are required to power-cycle the switch in order to restore operation.
```

```
Are you sure you want to shutdown the switch [y/n]?y
HA is disabled
Stopping blade 1
Shutting down the blade....
Stopping blade 2
Shutting down the blade....
Stopping blade 8
Shutting down the blade....

Broadcast message from root (pts/1) Tue Aug 23 14:23:06 2010...

The system is going down for system halt NOW !!
```

2. Power off the chassis by flipping the AC power switches on the power supplies to **O** (LEDs inside AC power switches should turn off). To maintain the ground connections, leave power cords connected to the power supplies and to the electrical outlets.

Monitoring System Components

In this chapter

Monitoring overview

The Brocade DCX 8510-4 is engineered for reliability and requires no routine operational steps or maintenance. This chapter provides information about determining the status of each component using LEDs and CLI commands. Refer to the *Web Tools Administrator's Guide* and the *Fabric OS Administrator's Guide* for additional information.

There are two commands that can be especially helpful in monitoring the health of the Brocade DCX 8510-4. These commands are **switchShow** and **chassisShow**. Examples of these commands are shown below.

Note in the **switchShow** command the new switchType for the Brocade DCX 8510-4 as well as the 16 Gbps speed identification for capable ports. The output has been truncated to reduce information duplication.

```
DCX-4_130:admin> switchshow
switchName:     DCX-4_130
switchType:     121.3
switchState:    Online
switchMode:     Native
switchRole:     Principal
switchDomain:   130
switchId:       fffc82
switchWwn:      10:00:00:05:33:03:2c:00
zoning:         ON (BB)
switchBeacon:   OFF
FC Router:      ON
FC Router BB Fabric ID: 10
Address Mode:   0

Index Slot Port Address Media  Speed  State       Proto
========================================================
```

```
 0    1    0    820000   id    N8    Online     FC   F-Port
10:00:00:05:1e:f8:a0:b4
 1    1    1    820100   id    N8    Online     FC   F-Port
10:00:00:05:33:26:0e:65
 2    1    2    820200   id    N8    Online     FC   F-Port
10:00:00:05:33:48:5e:f5
 3    1    3    820300   id    N8    Online     FC   F-Port
10:00:00:05:1e:f8:a0:b3
 4    1    4    820400   id    N8    Online     FC   F-Port
10:00:00:05:33:26:10:15
 5    1    5    820500   id    N8    Online     FC   F-Port
10:00:00:05:1e:f8:a0:b1
 6    1    6    820600   id    N8    Online     FC   F-Port
10:00:00:05:33:48:5e:d0
 7    1    7    820700   id    N8    Online     FC   F-Port
10:00:00:05:33:26:df:6b
 8    1    8    820800   id    N8    Online     FC   F-Port
10:00:00:05:33:26:df:6a
 9    1    9    820900   id    N8    Online     FC   F-Port
10:00:00:05:33:48:6b:ea
10    1   10    820a00   id    N8    Online     FC   F-Port
10:00:00:05:33:26:10:28
11    1   11    820b00   id    N8    Online     FC   F-Port
10:00:00:05:33:26:10:73
12    1   12    820c00   id    N8    Online     FC   F-Port
10:00:00:05:33:48:5e:d1
13    1   13    820d00   id    N8    Online     FC   F-Port
10:00:00:05:33:26:10:29
14    1   14    820e00   id    N8    Online     FC   F-Port
10:00:00:05:1e:f9:72:47
15    1   15    820f00   id    N8    Online     FC   F-Port
10:00:00:05:33:26:0e:8a
16    1   16    821000   id    N8    Online     FC   F-Port
10:00:00:05:33:26:0e:8b
17    1   17    821100   id    N8    Online     FC   F-Port
10:00:00:05:33:48:6b:eb
18    1   18    821200   id    N8    Online     FC   F-Port
10:00:00:05:1e:f9:72:46
19    1   19    821300   id    N8    Online     FC   F-Port
10:00:00:05:33:26:10:14
20    1   20    821400   id    N8    Online     FC   F-Port
10:00:00:05:33:26:0e:64
21    1   21    821500   id    N8    Online     FC   F-Port
10:00:00:05:33:26:10:72
22    1   22    821600   id    N8    Online     FC   F-Port
10:00:00:05:33:48:5e:f4
23    1   23    821700   id    N8    Online     FC   F-Port
10:00:00:05:1e:f8:a0:b2
24    1   24    821800   --    N16   No_Module  FC
25    1   25    821900   --    N16   No_Module  FC
26    1   26    821a00   --    N16   No_Module  FC
27    1   27    821b00   --    N16   No_Module  FC
28    1   28    821c00   id    N8    No_Light   FC
29    1   29    821d00   id    N8    No_Light   FC
30    1   30    821e00   id    N8    No_Light   FC
31    1   31    821f00   id    N8    No_Light   FC
32    1   32    822000   id    N8    No_Light   FC
33    1   33    822100   id    N8    No_Light   FC
34    1   34    822200   id    N8    No_Light   FC
35    1   35    822300   id    N8    No_Light   FC
```

```
 36    1   36    822400    id     N8    No_Light     FC
 37    1   37    822500    id     N8    No_Light     FC
 38    1   38    822600    id     N8    No_Light     FC
 39    1   39    822700    id     N8    No_Light     FC
 40    1   40    822800    id     N8    No_Light     FC
 41    1   41    822900    id     N8    No_Light     FC
 42    1   42    822a00    id     N8    No_Light     FC
 43    1   43    822b00    id     N8    No_Light     FC
 44    1   44    822c00    id     N8    No_Light     FC
 45    1   45    822d00    --     N16   No_Module    FC
 46    1   46    822e00    --     N16   No_Module    FC
 47    1   47    822f00    --     N16   No_Module    FC
256    3    0    ------    id     16G   No_SigDet    FC
257    3    1    ------    id     16G   No_SigDet    FC
258    3    2    ------    id     16G   No_SigDet    FC
259    3    3    ------    id     16G   No_SigDet    FC
260    3    4    ------    id     16G   No_SigDet    FC
261    3    5    ------    id     16G   No_SigDet    FC
262    3    6    ------    id     16G   No_SigDet    FC
263    3    7    ------    id     16G   No_SigDet    FC
264    3    8    ------    id     16G   No_SigDet    FC
265    3    9    ------    id     16G   No_SigDet    FC

<output truncated>

DCX-4_130:root>
```

Note in the **chassisShow** command the Chassis Family designation for the Brocade DCX 8510-4 along with specific information about every field-replaceable unit in the chassis.

```
DCX-4_130:root> chassisshow

Chassis Family:          DCX8510-4
Chassis Backplane Revision: 2

SW BLADE   Slot: 1
Header Version:         2
Power Consume Factor:   -160
Power Usage (Watts):    -106
Factory Part Num:       60-1002144-02
Factory Serial Num:     BQB0345F00X
Manufacture:            Day: 19  Month: 11  Year: 2010
Update:                 Day: 29  Month: 3  Year: 2011
Time Alive:             32 days
Time Awake:             0 days

CP BLADE   Slot: 4
Header Version:         2
Power Consume Factor:   -40
Factory Part Num:       60-1000376-08
Factory Serial Num:     AHJ0420F08K
Manufacture:            Day: 21  Month: 5  Year: 2010
Update:                 Day: 29  Month: 3  Year: 2011
Time Alive:             229 days
Time Awake:             0 days

CP BLADE   Slot: 5
Header Version:         2
Power Consume Factor:   -40
```

```
Factory Part Num:       60-1000376-08
Factory Serial Num:     AHJ0420F086
Manufacture:            Day: 21  Month:  5  Year: 2010
Update:                 Day: 29  Month:  3  Year: 2011
Time Alive:             229 days
Time Awake:             0 days

CORE BLADE  Slot: 3
Header Version:         2
Power Consume Factor:   -135
Power Usage (Watts):    -88
Factory Part Num:       60-1002142-02
Factory Serial Num:     BQD0344F01K
Manufacture:            Day: 18  Month: 11  Year: 2010
Update:                 Day: 29  Month:  3  Year: 2011
Time Alive:             47 days
Time Awake:             0 days

CORE BLADE  Slot: 6
Header Version:         2
Power Consume Factor:   -135
Power Usage (Watts):    -87
Factory Part Num:       60-1002099-01
Factory Serial Num:     BQD0337F00A
Manufacture:            Day: 16  Month:  9  Year: 2010
Update:                 Day: 29  Month:  3  Year: 2011
Time Alive:             77 days
Time Awake:             0 days

AP BLADE  Slot: 7
Header Version:         2
Power Consume Factor:   -250
Factory Part Num:       60-1001157-21
Factory Serial Num:     ATM0431F008
Manufacture:            Day: 20  Month:  9  Year: 2010
Update:                 Day: 29  Month:  3  Year: 2011
Time Alive:             4 days
Time Awake:             0 days

SW BLADE  Slot: 8
Header Version:         2
Power Consume Factor:   -140
Power Usage (Watts):    -95
Factory Part Num:       60-1002145-02
Factory Serial Num:     BQA0344F00S
Manufacture:            Day:  6  Month: 11  Year: 2010
Update:                 Day: 29  Month:  3  Year: 2011
Time Alive:             32 days
Time Awake:             0 days

POWER SUPPLY  Unit: 1
Header Version:         2
Power Consume Factor:   2000
Factory Part Num:       23-0000067-01
Factory Serial Num:     AGC2M03FR4P
Manufacture:            Day:  7  Month:  6  Year: 2010
Update:                 Day: 29  Month:  3  Year: 2011
Time Alive:             229 days
Time Awake:             0 days
```

```
POWER SUPPLY  Unit: 2
Header Version:          2
Power Consume Factor:    2000
Factory Part Num:        23-0000067-01
Factory Serial Num:      AGC2M03FR7T
Manufacture:             Day:  7  Month:  6  Year: 2010
Update:                  Day: 29  Month:  3  Year: 2011
Time Alive:              221 days
Time Awake:              0 days

FAN  Unit: 1
Header Version:          2
Power Consume Factor:    -126
Factory Part Num:        60-1000384-09
Factory Serial Num:      AGB0623F0AM
Manufacture:             Day:  7  Month:  6  Year: 2010
Update:                  Day: 29  Month:  3  Year: 2011
Time Alive:              229 days
Time Awake:              0 days

FAN  Unit: 2
Header Version:          2
Power Consume Factor:    -126
Factory Part Num:        60-1000384-09
Factory Serial Num:      AGB0623F0AK
Manufacture:             Day:  7  Month:  6  Year: 2010
Update:                  Day: 29  Month:  3  Year: 2011
Time Alive:              229 days
Time Awake:              0 days

WWN  Unit: 1
Header Version:          2
Power Consume Factor:    -1
Factory Part Num:        60-1000888-05
Factory Serial Num:      ANN2524F01N
Manufacture:             Day:  7  Month:  6  Year: 2010
Update:                  Day: 29  Month:  3  Year: 2011
Time Alive:              229 days
Time Awake:              0 days
ID:                      BRD0000CA
Part Num:                SLKWRM0000X4S

WWN  Unit: 2
Header Version:          2
Power Consume Factor:    -1
Factory Part Num:        60-1000888-05
Factory Serial Num:      ANQ0417F03P
Manufacture:             Day:  7  Month:  6  Year: 2010
Update:                  Day: 29  Month:  3  Year: 2011
Time Alive:              229 days
Time Awake:              0 days

Chassis Factory Serial Num: ANP2523F00E

DCX-4_130:root>
```

Determining the status of a port, application, or encryption blade

Use the following procedure to determine the status of a port or application blade.

1. Check the LEDs on the blade.

   - Figure 6 illustrates the FC8-64 port blade.
   - Figure 7 illustrates the FC8-32E port blade.
   - Figure 8 illustrates the FC8-48E port blade.
   - Figure 9 illustrates the FC16-32 port blade.
   - Figure 10 illustrates the FC16-48 port blade.
   - Figure 11 illustrates the FS8-18 encryption blade.
   - Figure 12 illustrates the FX8-24 extension blade.

   The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see Table 3.

2. Check the blade status by entering **slotShow**.

Blade illustrations

1	Status LED	3	Fibre Channel port
2	Power LED	4	Port Status LED
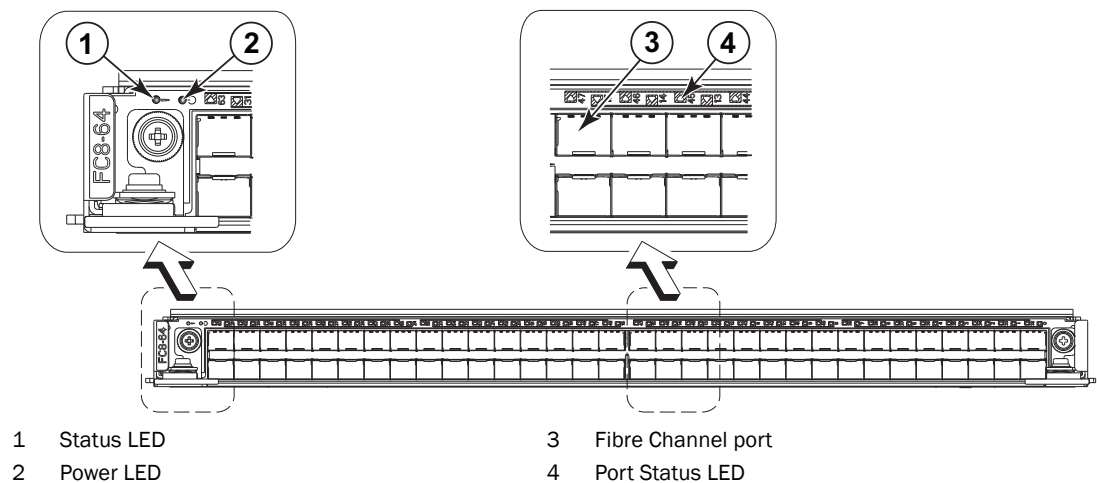
FIGURE 6   **FC8-64 port blade**

NOTE
The FC8-64 port blade requires mSFPs (standard SFPs do not fit) as well as narrower OM-3 LC cables offered by major manufacturers such as Corning, Molex, and Amphenol.
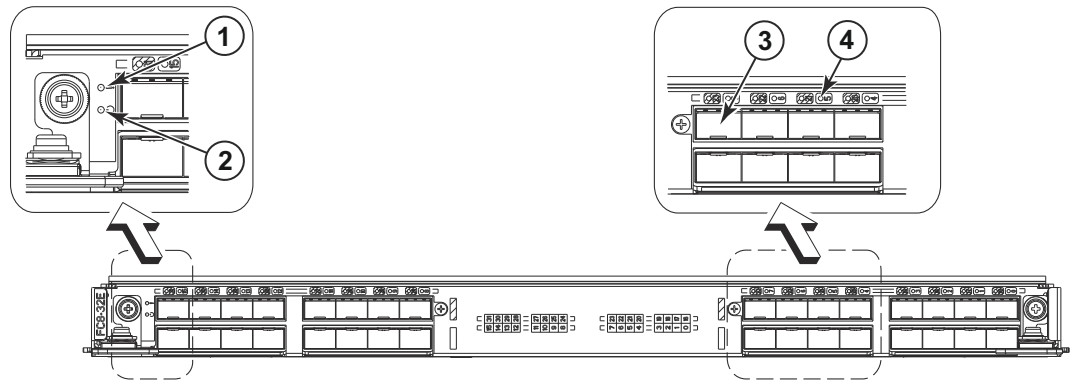
1	Status LED	3	Fibre Channel port
2	Power LED	4	Port Status LED

FIGURE 7 FC8-32E port blade
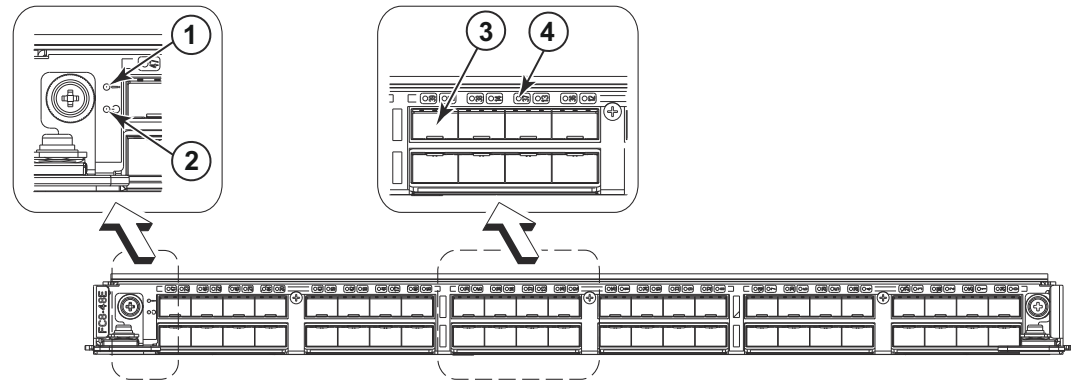
1	Status LED	3	Fibre Channel port
2	Power LED	4	Port Status LED

FIGURE 8 FC8-48E port blade

1	Status LED	3	Fibre Channel port
2	Power LED	4	Port Status LED

FIGURE 9   **FC16-32 port blade**

1	Status LED	3	Fibre Channel port
2	Power LED	4	Port Status LED
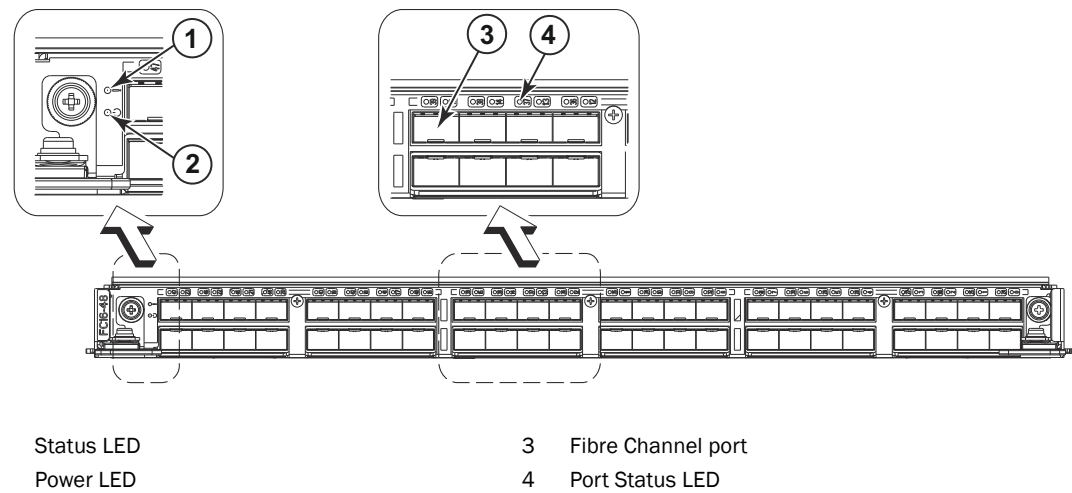
FIGURE 10   **FC16-48 port blade**

1	Status LED	3	Fibre Channel port
2	Power LED	4	Port Status LED
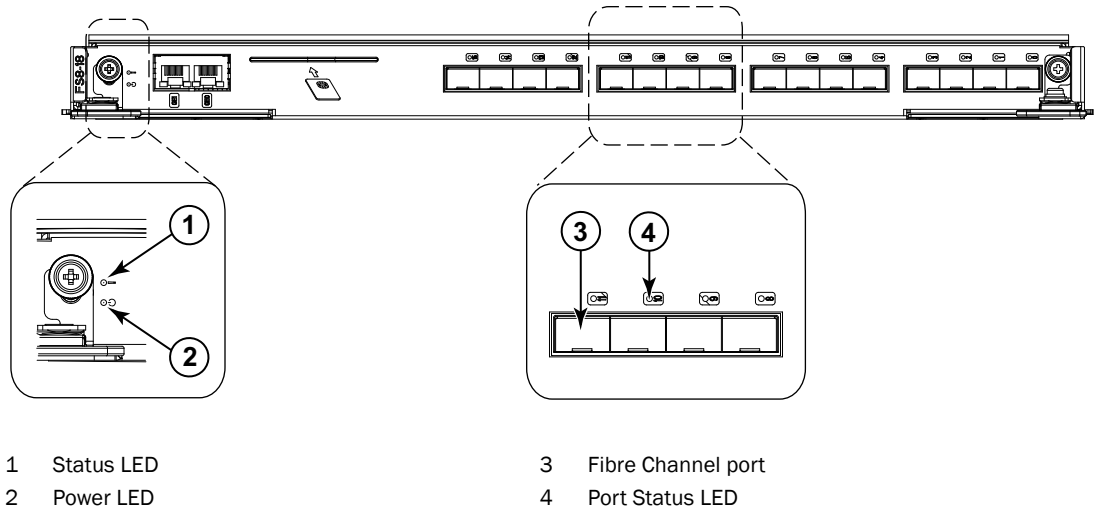
FIGURE 11   FS8-18 encryption blade

1	Status LED	5	10GbE (XGE) port 0
2	Power LED	6	Port status LED for 10GbE port 0
3	GbE (GE) port 6	7	Port map
4	Port status LED for GbE port 6		
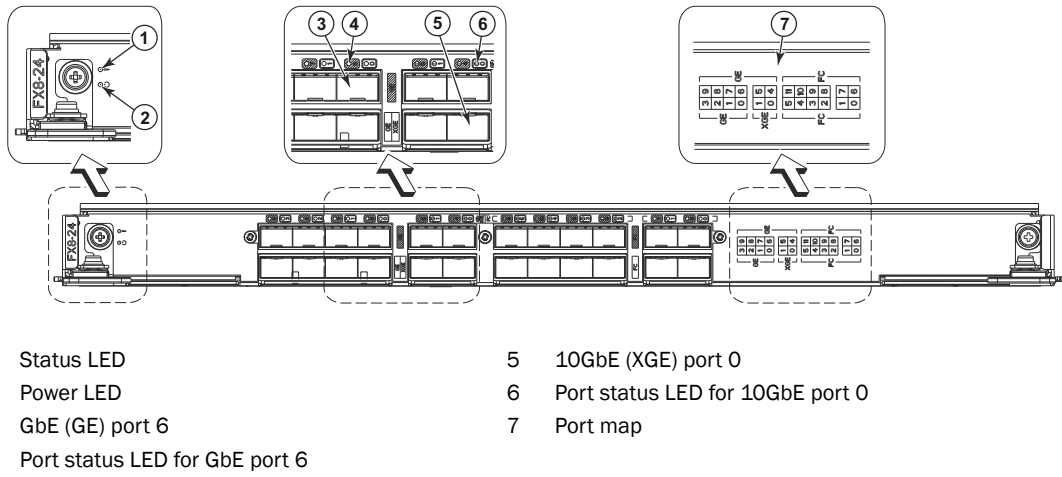
FIGURE 12   FX8-24 extension blade

See "FX8-24 blade" for information about trunking groups on this blade.

Table 3 describes the port and application blade LED patterns and the recommended actions for those patterns.

TABLE 3   Port and application blade LED descriptions

LED purpose	Color	Status	Recommended action
Power LED	Steady green	Blade is enabled.	No action required.
	No light (LED is off)	Blade is not powered on.	Ensure that the blade is firmly seated and either the thumbscrew is fully engaged or the slider is pushed up and the ejectors are fully engaged.
Status LED	No light (LED is off)	Blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	Blade is faulty.	Ensure that the blade is firmly seated and check the status by entering the **slotShow** command. If LED remains amber, consult the Brocade DCX 8510-4 supplier.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.

TABLE 3   Port and application blade LED descriptions (Continued)

LED purpose	Color	Status	Recommended action
FC Port Status	No light (LED is off)	Port has no incoming power, or there is no light or signal carrier detected.	Verify that the power LED is on, check the transceiver and cable.
		Polling is in progress.	Allow 60 seconds for polling to complete.
		Connected device is configured in an offline state.	Verify the status of the connected device.
	Steady green	Port is online (connected to an external device) but has no traffic.	No action required.
	Slow-flashing green (on 1 second, then off 1 second)	Port is online but segmented, indicating a loopback plug or cable or an incompatible switch.	Verify that the correct device is attached to the Brocade DCX 8510-4.
	Fast-flashing green (on 1/4 second, then off 1/4 second	Port is in internal loopback (diagnostic).	No action required.
	Flickering green	Port is online, with traffic flowing through port.	No action required.
	Steady amber	Port is receiving light or signal carrier, but it is not online yet.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Port is disabled due to diagnostic tests or **portDisable** or **portCfgPersistentEnable** command.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Transceiver or port is faulty.	Change the transceiver or reset the switch from the workstation.
	Alternating green/amber	Port is bypassed.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
GbE Port Status (FX8-24) - both 1 GbE and 10 GbE ports	No light (LED is off)	Port has no incoming power, or there is no light or signal carrier detected.	Verify that the power LED is on, check the transceiver and cable.
	Steady green	Port is online but has no traffic.	No action required.
	Slow-flashing green (on 1 second, then off 1 second)	Beacon. Used to identify specific ports.	No action required.
	Flickering green	Port is online, with traffic flowing through port.	No action required.
	Fast-flashing amber (on 1/4 second, then off 1/4 second)	Transceiver or port is faulty.	Change the transceiver or reset the switch from the workstation.

Determining the status of a control processor blade (CP8)

Complete the following steps to determine the status of a control blade (CP8)

1. Check the LED indicators on the CP blade (Figure 13). The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see Table 4.

2. Check the port blade status by entering **slotShow** and **haShow**.

Figure 13 identifies the CP8 blade.
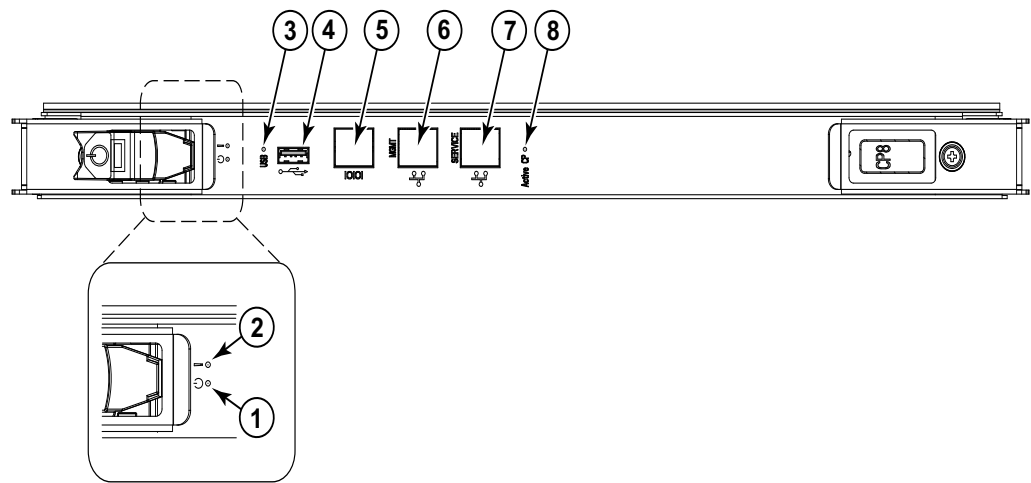
1	Power LED	5	Console port (Serial)
2	Status LED	6	Ethernet port (Mgmt IP)
3	USB LED	7	Ethernet port (Service IP)
4	USB port	8	Active CP LED

FIGURE 13   **Control processor blade (CP8)**

Table 4 describes the CP blade LED patterns and the recommended actions for those patterns.

TABLE 4   CP blade LED descriptions

LED purpose	Color	Status	Recommended action
Power	Steady green	CP blade is on.	No action required.
	No light (LED is off)	CP blade is not on.	Ensure that the blade is firmly seated and has power.

TABLE 4   CP blade LED descriptions (Continued)

LED purpose	Color	Status	Recommended action
Status	No light (LED is off)	CP blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	CP blade is faulty or the switch is still booting.	Ensure that the blade is firmly seated and the switch has completed booting. If LED remains yellow, consult the Brocade DCX 8510-4 supplier.
	Slow-flashing amber (on 2 seconds; then off 2 seconds)	CP blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If the LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second; then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.
Ethernet Link Status	No light (LED is off)	Either an Ethernet link is not detected, or it does not have incoming power.	Ensure that the blade has power, the Ethernet cable is firmly seated, and the connected device is functioning.
	Flickering green/amber	Ethernet link is healthy and traffic is flowing through port.	No action required.
Ethernet Link Speed	No light (LED is off)	Ethernet link speed is 10 Mb/s or CP blade does not have incoming power.	Ensure that the CP has power. **NOTE:** To force a persistent Ethernet link speed, enter the **ifModeSet** command.
	Steady green	Ethernet link speed is 100/1000 Mb/s.	No action required.
USB Status	Lamp on	USB stick enabled.	No action required.
	Lamp off	USB stick not present or disabled.	No action required.
Active CP	Steady blue	Active CP blade.	No action required.
	No light (LED is off)	Standby CP blade.	No action required.

Determining the status of a core switch blade (CR16-4)

Complete the following steps to determine the status of a core switch blade (CR16-4).

1. Check the LED indicators on the core switch blade (see the following figure). The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, refer to Table 5.

2. Check the core switch blade status by entering **slotShow** and **haShow**.

Table 13 identifies the core switch blade.
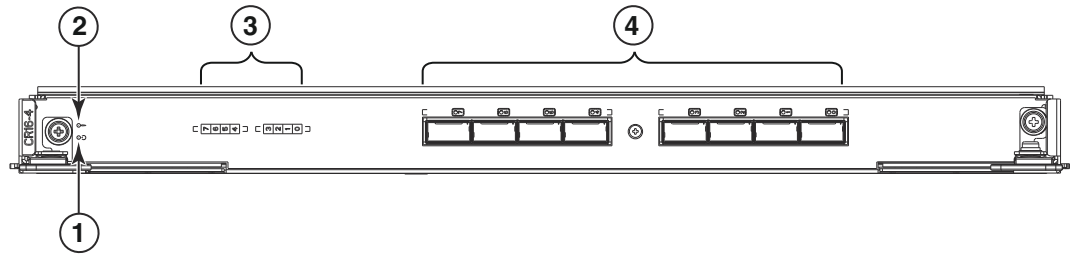
| 1 | Power LED | 3 | QSFP port map and trunking diagram |
| 2 | Status LED | 4 | QSFP connectors |

FIGURE 14 **Core switch blade (CR16-4)**

Table 5 describes the core switch blade LED patterns and the recommended actions for those patterns.

TABLE 5 CR blade LED descriptions

LED purpose	Color	Status	Recommended action
Power	Steady green	CR16-4 blade is on.	No action required.
	No light (LED is off)	CR16-4 blade is not on.	Ensure that the blade is firmly seated and has power.
Status	No light (LED is off)	CR16-4 blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	CR16-4 blade is faulty or the switch is still booting.	Ensure that the blade is firmly seated and the switch has completed booting. If the LED remains amber, consult the Brocade DCX 8510-4 supplier.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	CR16-4 blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If the LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.

TABLE 5   CR blade LED descriptions (Continued)

LED purpose	Color	Status	Recommended action
QSFP connector status LED	No light (LED is off)	No QSFP module, all four QSFP ports are disabled	No action needed if the QSFP is not installed or verify that the QSFP is fully inserted.
	Steady amber	QSFP module is in, all four ports have no signal/no sync.	Ensure that the cable is properly connected. If the LED remains amber, consult the Brocade DCX 8510-4 supplier.
	Blinking amber	Port is disabled or faulted, FC link activity, segmented, loopback mode, also during transition between cable plug in and all four ports online.	Check for console messages or wait for all four ports to come online.
	Steady green	QSFP module is in and all ports are online.	No action needed.

Refer to Figure 36 and Table 27 for a map of the ports and a table of external ports to internal ports as shown in the **slotShow** command

Determining the status of a power supply

Complete the following steps to determine the status of a power supply.

1. Check the LED indicator on the power supply (see the following figure). The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, refer to Table 6. The Brocade DCX 8510-4 has two power supplies. Be sure to check each module.

2. Check the power supply status by entering **psShow**.

   The power supply status displays OK, Absent, or Faulty. If a power supply displays absent or faulty, contact the Brocade DCX 8510-4 supplier to order replacement parts. Both physically absent or faulty could also be the result of the power supply not being properly seated or being turned off.

Table 15 shows a power supply.

1   Power LED

FIGURE 15   Power supply

Table 6 describes the power supply LED patterns and the recommended actions for those patterns.

TABLE 6   Power supply LED descriptions

LED purpose	Color	Status	Recommended action
Power	No light (LED is off)	Power supply does not have incoming power and is not providing power to the Brocade DCX 8510-4.	Ensure that the power supply is firmly seated, the Brocade DCX 8510-4 has incoming power, both power cables are connected, and AC power switches are on.
	Steady green	Power supply has incoming power and is providing power to the Brocade DCX 8510-4.	No action required.
	Flashing green	Power supply is about to fail.	Replace the power supply.

Determining the status of a blower assembly

Complete the following steps to determine the status of a blower assembly.

1. Check the LED indicators on the blower assembly (see the following figure). The LED patterns may temporarily change during POST and other diagnostic tests; for information about how to interpret the LED patterns, refer to Table 7. The Brocade DCX 8510-4 has two blowers. Be sure to check each module.

2. Check the blower assembly status using the **fanShow** command.

   The status for each blower assembly displays **OK**, **Absent**, or **Faulty**. The RPM of each fan in the assembly is also provided. If a blower assembly displays absent or faulty, contact the Brocade DCX 8510-4 supplier to order replacement parts. Both physically absent or faulty could also be the result of the power supply not being properly seated.

Figure 16 shows the blower assembly.

| 1 | Power LED | 2 | Fault LED |

FIGURE 16   Blower assembly

Table 7 describes the LED patterns for the blower assembly.

TABLE 7   Blower assembly LED descriptions

LED purpose	Color	Status	Recommended action
Power	No light (LED is off)	Blower assembly does not have power.	Ensure that the blower assembly is firmly seated and has power.
	Steady green	Blower assembly has power.	No action required.
Fault	No light (LED is off)	Blower assembly is either healthy or does not have power.	Ensure that the blower assembly has power.
	Steady amber	Blower assembly has a failure (full or partial).	Replace the blower assembly.
	Slow-flashing amber (on 2 sec, then off 2 sec)	Blower assembly is not seated correctly or is faulty.	Pull the unit out and reseat it. If the LED continues to flash, replace the unit.
	Flashing amber (on 1/2 sec, then off 3.5 sec)	Fan is disabled.	Run the **fanEnable** command to enable the fan.
	Fast-flashing amber (on 1/2 sec, then off 1/2 sec)	Environmental range exceeded.	Check for out-of-bounds environmental condition, resolve any problems, and reseat the unit. If the LED continues to flash, replace the unit.

Determining the status of a WWN card

Complete the following steps to determine the status of a WWN card.

NOTE
The WWN bezel (logo plate) covers the WWN cards. The LEDs on the WWN cards are not visible unless the bezel is removed.

Enter the **chassisShow** command to display information about the WWN card. (WWN units correspond to information specific to the WWN card.) Error messages that may indicate problems with a WWN card are summarized in Table 8.

TABLE 8   Messages that may indicate WWN card failure

Type of message	Sample error message
WWN unit fails its FRU (field replaceable unit) header access.	`0x24c (fabos): Switch: switchname, error` `EM-I2C_TIMEOUT, 2, WWN 1 I2C timed out: state 0x4`

WWN unit fails to power on	`<timestamp>, [EM-1004], <sequence-number>,,`
	`CRITICAL, <system-name>, WWN # failed to power on`
	or
	`<timestamp>, [EM-1043], <sequence-number>,,`
	`WARNING, <system-name>, Can't power <FRU Id>`
	`<state (on or off)>.`

WWN unit is being faulted.	`0x24c (fabos): Switch: switchname, Critical` `EM-WWN_UNKNOWN, 1, Unknown WWN #2 is being` `faulted` or `<timestamp>, [EM-1003], 40, SLOT 7	FFDC |` `CHASSIS, CRITICAL, Brocade_DCX, WWN 2 has unknown` `hardware identifier: FRU faulted` or `<timestamp>, [EM-1034], <sequence-number>,,` `ERROR, <system-name>, WWN # set to faulty,` `rc=<return code>`

WWN unit is not present or is not accessible.	`0x24c (fabos): Switch: switchname, Error`
	`EM-WWN_ABSENT, 2, WWN #1 not present`
	or
	`<timestamp>, [EM-1036], <sequence-number>,,`
	`WARNING, <system-name>, <FRU Id> is not`
	`accessible.`

Writing to the FRU history log (**hilSetFruHistory**) has failed.	`0x24c (fabos): Switch: switchname, Error`
	`EM-HIL_FAIL, 2, HIL Error: hilSetFruHistory`
	`failed, rc=-3 for SLOT 3`

WWN unit insertion was detected	`<timestamp>, [EM-1049], <sequence-number>,,`
	`INFO, <system-name>, FRU WWN # insertion`
	`detected.`

WWN unit removal was detected	`<timestamp>, [EM-1050], <sequence-number>,,` `INFO, <system-name>, FRU WWN # removal detected.`

Figure 17 displays the WWN bezel (logo plate). The WWN cards are under the bezel.
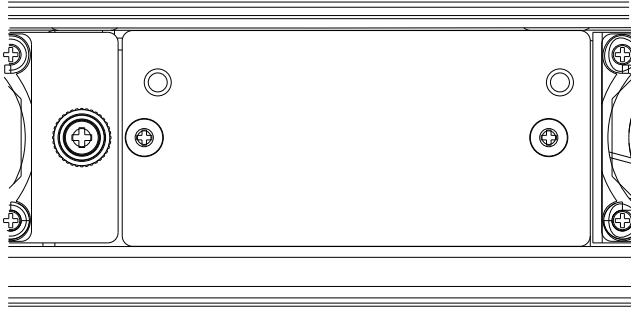
FIGURE 17   WWN bezel (logo plate) for DCX 8510-4

Removal and Replacement Procedures

In this chapter

Introduction

NOTE
Read the safety notices before servicing ("Safety notices").

The field-replaceable units (FRUs) in the Brocade DCX 8510-4 can be removed and replaced without special tools. The Brocade DCX 8510-4 can continue operating during many of the FRU replacements if the conditions specified in the procedures are followed.

The following sections contain FRU removal and replacement procedures (RRPs).

ESD precautions

The Brocade DCX 8510-4 contains electrostatic discharge (ESD) sensitive FRUs. When working with any Brocade DCX 8510-4 FRU, use correct ESD procedures.

- Wear a wrist grounding strap connected to chassis ground (if the Brocade DCX 8510-4 is plugged in) or a bench ground.

- Store ESD-sensitive components in antistatic packaging.

Chassis door removal and replacement

NOTE
The chassis door must be installed to ensure the Brocade DCX 8510-4 meets EMI and other regulatory certifications. Additionally, if ICL cables are not used, EMI plugs must be inserted in the ICL cable ports to meet certification standards.

Time and items required

The replacement procedure for the chassis door takes less than five minutes. See .

Removing a chassis door

Support the door to prevent it from falling. Pull and remove the door. It will pop off the ball studs.
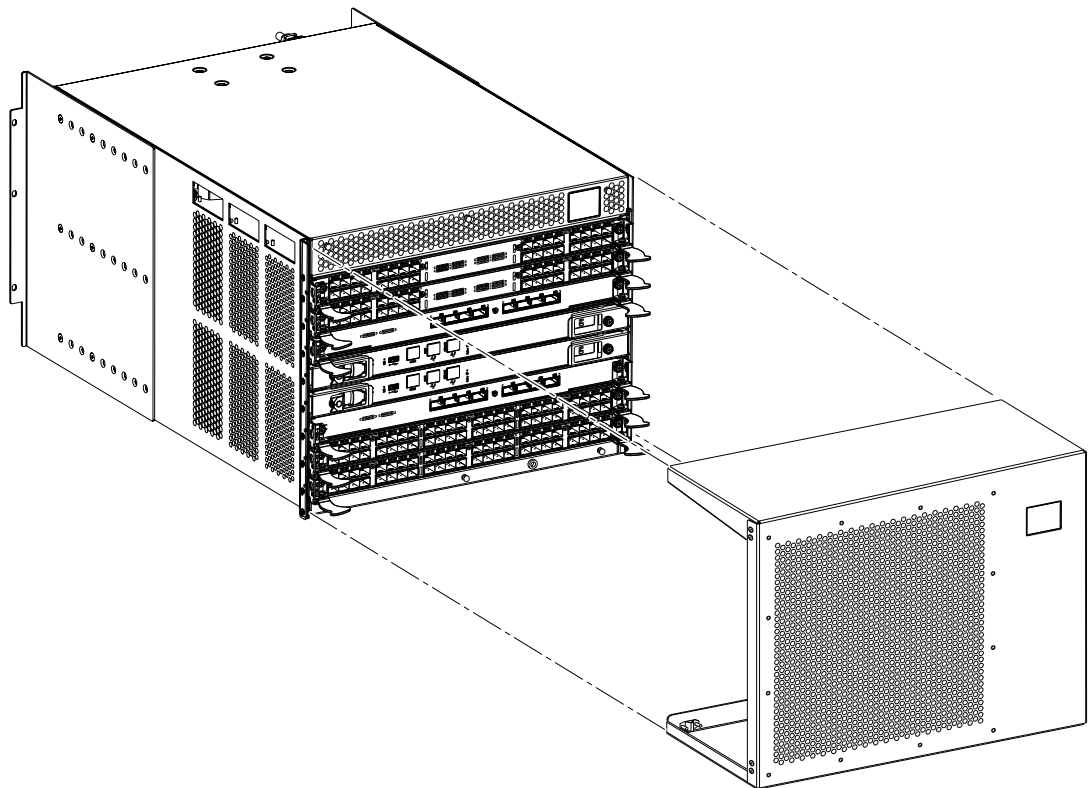
FIGURE 18   Removal and replacement of the chassis door

Replacing a chassis door

Complete the following steps to reinstall the door.

1. Align the holes in the door with the ball studs on the chassis

2. Push the door into place. It will snap onto the studs.

Vertical cable management fingers removal and replacement

The Brocade DCX 8510-4 comes equipped with two vertical cable management finger assemblies. It can continue to operate during the replacement of the cable management fingers. Due to the horizontal orientation of the blades in the Brocade DCX 8510-4, the finger assemblies are attached to the uprights of the mounting rack. See Figure 19 for this procedure.

Time and items required

The replacement procedure for the cable management fingers takes less than five minutes. A #1 Phillips screwdriver is required.

Removing a cable management finger assembly

Complete the following steps to remove the cable management finger assembly. Refer to Figure 19 for the location of the assembly.

1. Remove the chassis door.

2. Remove the cables from the cable management finger assembly and rearrange the cables around the assembly.

3. Unscrew and save the three (3) screws holding the finger assembly to the rack upright. Support the assembly to prevent it from falling.

4. Remove the cable management finger assembly.

5. If necessary, repeat steps 1 through 3 for the other finger assembly.
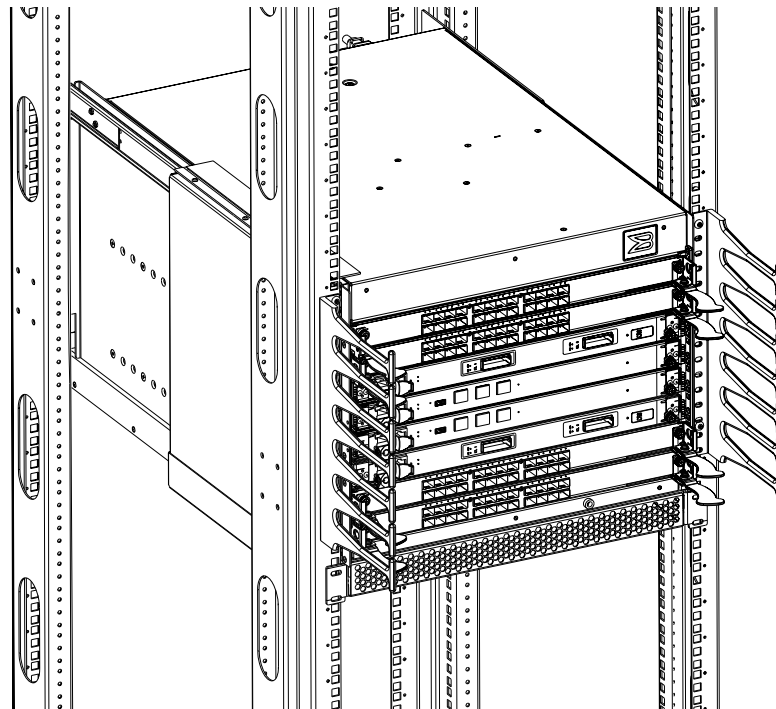
FIGURE 19   Removal and replacement of the vertical cable management finger assemblies

Replacing a cable management finger assembly

Complete the following steps to replace the cable management finger assembly.

1. Position and tighten the three (3) screws to secure the vertical cable management finger assembly to the rack upright.

2. Arrange the cables along the cable management finger assembly.

3. If necessary, repeat steps 1 and 2 for the other cable management assembly.

4. Replace the chassis door.

Port, application, and encryption blade removal and replacement

This section describes how to remove and replace port, application, and encryption blades. It does not cover the core (CR) blades or the control processor (CP) blades.

ATTENTION
A filler panel should be removed only when being replaced with a port, application, or encryption blade, or a filler panel. Any slot that is not occupied by a blade should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

Slots are numbered from 1 through 8, from bottom to top when facing the port side of the Brocade DCX 8510-4. Port, application, and encryption blades can be installed in slots 1-2 and 7-8.

Time and items required

The replacement procedure for each blade takes less than 10 minutes. Removing and restoring transceivers and cables may take longer depending on how many must be changed. The following items are required for the blade and filler panel replacement:

- Electrostatic discharge (ESD) grounding strap
- Workstation computer
- Replacement blade or filler panel
- #2 Phillips screwdriver
- Small form-factor pluggable (SFP+, or mSFP) transceivers (as needed)
- Optical and copper cables (as needed)

NOTE
For information about the transceivers that are qualified for the Brocade chassis, go to
http://www.brocade.com/products/interop_and_compatibility.jsp.

Removing a blade

For this procedure, refer to Figure 20.

Complete the following steps to remove a blade.

> **ATTENTION**
> If multiple blades are being replaced, replace one blade at a time.

> **ATTENTION**
> Follow electrostatic discharge (ESD) precautions while removing any blade.

> **NOTE**
> The FC8-64 port blade, the FS8-18 encryption blade and the FX8-24 application blade are compatible only with the Brocade DCX, DCX-4S, DCX 8510-8, and DCX 8510-4.The FC8-32E, FC8-48E, FC16-32 and FC16-48 port blades are compatible only with the DCX 8510-8 and DCX 8510-4.

1. Remove the chassis door.

2. Check the power LED, status LED, and port status LED to identify any possible problems. A failed port or application blade can be identified by inspecting the LEDs on the front panel of each blade.

3. Establish a Telnet or console session.

   Before replacing a blade, establish a Telnet or console connection to determine a failure and verify operation after replacement. Use the **switchShow** command to view the status of blades.

4. Check for adequate cable slack. Ensure there is plenty of cable slack to remove a blade without cable obstruction.

5. Ensure that the part number on the unit being replaced matches the replacement part number. The **chassisShow** command displays information about the blades, including part numbers (*xx-xxxxxxx-xx*), serial numbers, and additional status.

6. Ensure that traffic is not flowing through the blade (port status LED should be off) prior to disconnecting cables.

   > **NOTE**
   > Before removing any cables from a blade, note the cable order (identify each cable by its physical port). It is a good practice to keep a table of cable to port mapping.

7. Ensure that traffic is not flowing through the blade.

8. Disconnect all cables and transceivers from the blade. For mSFP transceivers(FC8-64 only), it is recommended that you use the pull tab to remove the transceiver from the blade.

9. Perform the appropriate following action based on the type of blade:

   - **For FC8-64, FC8-32E, FC8-48E, FC16-32, FC16-48 port blades, FX8-24 application blade, and FS8-18 encryption blade:** Unscrew the two thumb screws from the ejectors on the blade using the Phillips screwdriver. Unscrew the left thumb screw until it pops out. This initiates a hot-swap request.

10. Wait for the power LED to turn off in response to the hot-swap request before removing the blade.

11. Perform the appropriate following action based on the type of blade:

- **For FC8-64, FC8-32E, FC8-48E, FC16-32, FC16-48 port blades, FX8-24 application blade, and FS8-18 encryption blade:** Open the ejectors by rotating them toward the center of the blade face. Pull the blade out of the chassis using the ejectors.

12. If the blade is not being replaced by another blade, install a filler panel.
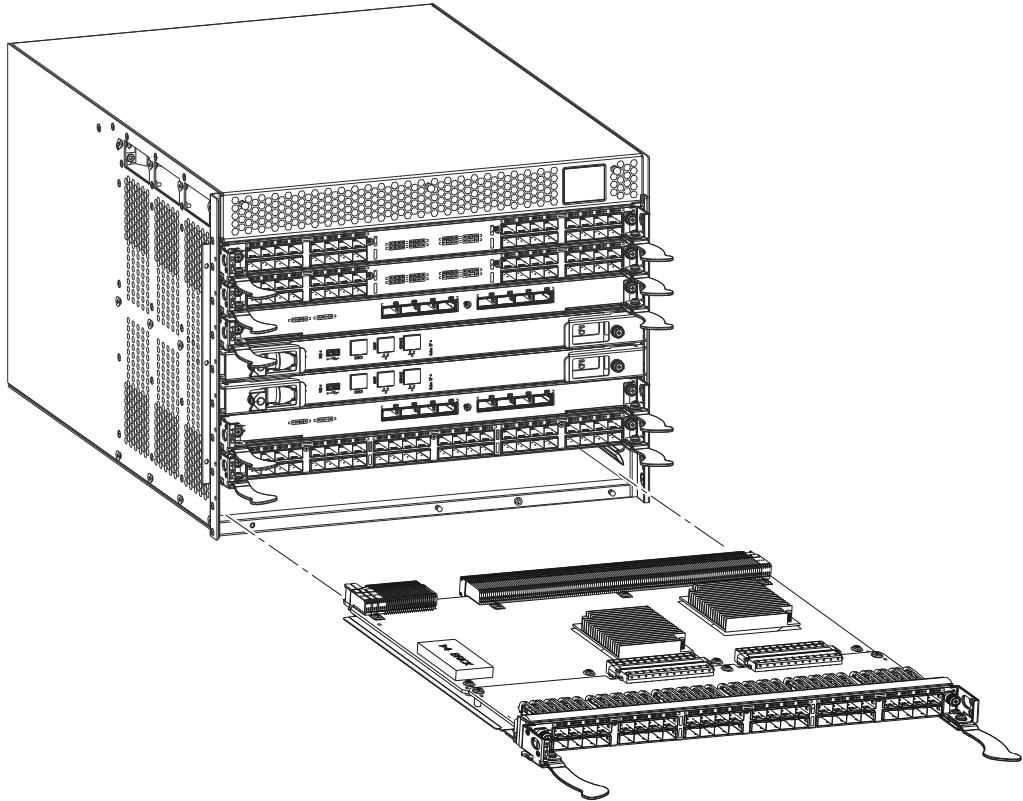
FIGURE 20   Removal and replacement of the port, application, or encryption blades (FC16-48 port blade shown)

Replacing a blade

For this procedure, refer to Figure 20.

Complete this procedure to replace a blade.

ATTENTION
Follow electrostatic discharge (ESD) precautions while replacing any blade.

1. Orient the blade so that the ports are at the front of the chassis and the flat side of the blade is on the bottom.

2. Perform the appropriate following action based on the type of blade:

- **For FC8-64, FC8-32E, FC8-48E, FC16-32, FC16-48 port blades, FX8-24 application blade, and FS8-18 encryption blade:** Open the ejectors by rotating them toward the center of the blade face, align the flat side of the blade inside the left and right rail guides in the slot, and slide the blade into the slot until it is firmly seated.

3. Perform the appropriate following action based on the type of blade:

   - **For FC8-64, FC8-32E, FC8-48E, FC16-32, FC16-48 port blades, FX8-24 application blade, and FS8-18 encryption blade:** Close the ejectors by rotating them away from the center of the blade. The levering action of the ejectors seats the blade in the slot.

4. Perform the appropriate following action based on the type of blade:

   - **For FC8-64, FC8-32E, FC8-48E, FC16-32, FC16-48 port blades, FX8-24 application blade, and FS8-18 encryption blade:** Tighten the thumb screws using the Phillips screwdriver.

5. Verify that the power LED on the port blade is displaying a steady green light. If it does not turn on, ensure that the blade is firmly seated.

6. The Status LED on the blade will show amber until POST completes for the blade. It should then display green. If it remains amber, the board may not be properly seated in the backplane or the board may be faulty.

7. Install the transceivers and cables in the blade. For mSFP (FC8-64 port blade only) transceivers, it is recommended that you install the cables in the transceivers before installing the transceivers in the blade.

8. Group and route the cables through the vertical cable management fingers.

9. Replace the chassis door.

Blade filler panel removal and replacement

This section describes how to remove and replace blade filler panels. Refer to for this procedure.

NOTE
Some filler panels have two thumbscrews and some have only one. Be sure to unscrew or tighten both if you are using the two-screw version.

Removing a filler panel

Complete the following steps to remove a filler panel from the chassis.

ATTENTION
A filler panel should be removed only when being replaced with a port, application, or encryption blade, or new filler panel. Any slot that is not occupied by a blade should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

1. Remove the chassis door.

2. Unscrew the thumbscrews on the panel using the Phillips screwdriver.

3. Using the tabs, pull the filler panel out of the chassis.
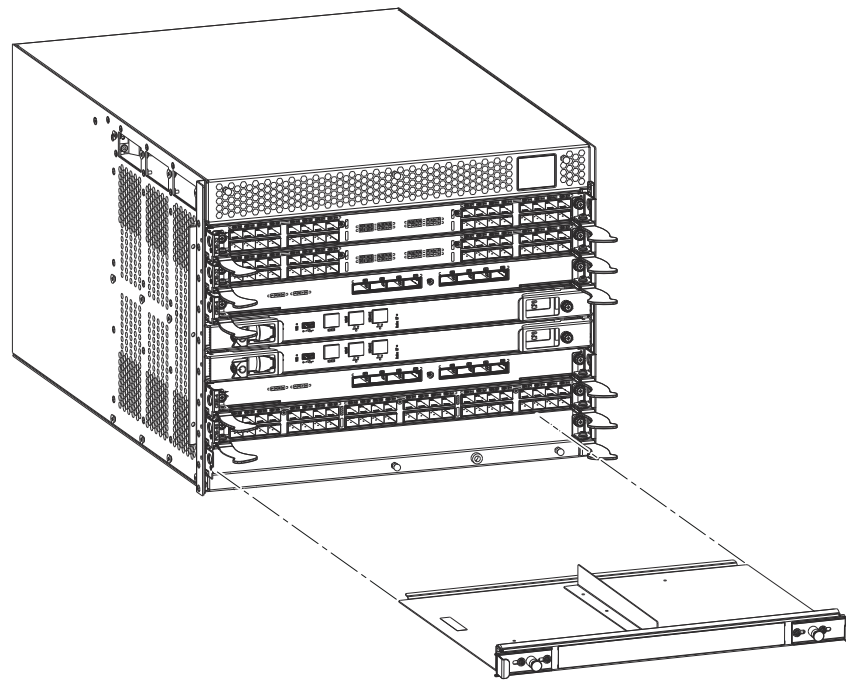
FIGURE 21   Removal and replacement of the blade filler panel

Replacing a filler panel

Do not leave a slot empty. This will adversely affect cooling of the chassis.

1. Orient the filler panel.
2. Slide the filler panel into the slot until it is firmly seated.
3. Tighten the thumbscrews.
4. Replace the chassis door.

Control processor blade (CP8) removal and replacement

This document describes how to remove and replace a control processor (CP8) blade. Each chassis has two CP8 blades. In the DCX 8510-4 they are located in slots 4 and 5.

NOTE
The CP8 blade is compatible only with the Brocade DCX Backbones (including the 8510s).

ATTENTION
Brocade's firmware upgrade policy for CP8 blades specifies testing for the current Fabric OS release and one version earlier. It is possible to upgrade by more than one version, but it is a very specific and detailed process. Read the directions under "Downloading firmware from an FTP server" or "Downloading firmware from a USB device" carefully.

ATTENTION
If the new CP blade does not have the same firmware as the active CP blade, the new blade must be upgraded to the same firmware version. You can determine the firmware version on the replacement blade and do a firmware upgrade if necessary after inserting the blade in the chassis, but you MUST disable high availability (HA) before inserting the new blade. If the new CP blade is severely down-level, a very specific procedure must be followed to bring the blade up to the correct firmware version.

NOTE
For the DCX 8510-4, slots are numbered from 1-8 from bottom to top, viewed from the port side of the chassis.

There are several references to additional Brocade manuals in this document. To access them online, go to this location on the MyBrocade web site, http://my.brocade.com/wps/myportal/!ut/p/c1/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gnN8cwY xNjY0MLV39XA89gc0OL4ABnIwNHU_2CbEdFAL7xxwo!/, click Product Manuals, and use the list box under the Product Manuals heading to find the specific manual you want. You may have to register for the MyBrocade site if you have not already done so.

Time and items required

The replacement procedure for the CP blade takes approximately 30 minutes. The following items are required for the CP blade replacement:

- ESD (electrostatic discharge) grounding strap.
- Workstation computer.
- Serial cable.
- IP address of an FTP server for backing up the Brocade DCX 8510-4 configuration.
- #2 Phillips screwdriver.
- Replacement Brocade DCX 8510-4 control processor blade (CP8).
- If you are upgrading through multiple versions of the Fabric OS, consult the "Steps for upgrading through multiple versions of Fabric OS" table to see which intermediate versions of the Fabric OS you might need. Plan carefully and for extra time if this is your situation.

Faulty CP blade indicators

Confirm that you need to replace the CP blade. The following events might indicate that a CP blade is faulty:

- The status LED on the CP blade is lit steady amber, or the power LED is not lit.

- The CP blade does not respond to Telnet commands, or the serial console is not available.

- The **slotShow** command does not show that the CP blade is enabled.

- The **haShow** command indicates an error.

- The clock is inaccurate, or the CP blade does not boot up or shut down normally.

- Any of the following messages display in the error log:

  - "Slot unknown" message relating to a CP slot

  - CP blade errors or I^{2}C timeouts

  - FRU: FRU_FAULTY messages for a CP blade

  - Configuration loader messages or "Sys PCI config" messages

  - Generic system driver messages ("FABSYS")

  - Platform system driver messages ("Platform")

  - EM messages that indicate a problem with a CP blade

  - Function fail messages for the CP master

For more information about error messages, refer to the *Fabric OS Message Reference*.

Recording critical Brocade DCX 8510-4 information

Back up the backbone configuration before you replace a CP blade. Refer to the *Fabric OS Administrator's Guide* for backup information.

ATTENTION
The following instructions reference specific slot numbers. These numbers will be different between the DCX 8510-8/DCX and the DCX 8510-4/DCX-4S chassis.

---

1. Connect to the chassis and log in as **admin**, using a serial console connection.

2. Type **haShow** to determine which CP blade is active. The example below is from a DCX chassis.

   ```
   DCX_124:admin> haShow
   Local CP (Slot 7, CP1) : Active
   Remote CP (Slot 6, CP0) : Standby, Healthy
   HA Enabled, Heartbeat Up, HA State Synchronized
   ```

3. Enter all remaining commands from the serial console for the active CP blade, unless otherwise indicated. For more information about commands, refer to the *Fabric OS Command Reference.*

4. If the active CP blade is faulted, automatic failover to the standby CP blade should have occurred. Confirm that the standby CP blade is active and power off the faulted CP blade, log in to standby CP blade, and skip to step 7.

   If automatic failover has not occurred, manually failover the faulty blade by moving the slider to the off position (to the right in a DCX 8510-4). Then power off the faulted blade, log in to standby CP blade, and skip to step 7.

5. If both CP blades are healthy and you want to replace the standby CP blade, log in to the active CP blade and skip to step 7.

6. If both CP blades are healthy and you want to replace the active CP blade, log in to the active CP blade and run the following steps:

   a. Run the **haFailover** command to make the standby CP blade the active blade. The currently active CP blade becomes the standby blade. Wait until the status LED on the currently active CP blade is no longer lit.

   b. Confirm the completion of the failover by running the **haShow** command.

   c. Log in to the new active CP blade.

7. Run **firmwareShow** to note the firmware version of the active CP blade.

   The following example shows the results of the firmwareshow command when the firmware versions on the two CP blades are not the same. Note the warning message at the end of the output.

```
DCX_120:root> firmwareshow
Slot Name        Appl     Primary/Secondary Versions           Status
-----------------------------------------------------------------------
   4 CP0         FOS      v6.4.0a                               STANDBY
                          v6.4.0a
   5 CP1         FOS      v7.0.0                                ACTIVE *
                          v7.0.0

WARNING: The local CP and remote CP have different versions
of firmware, please retry firmwaredownload command.

DCX_120:root>
```

8. Run **haDisable** from the active CP blade to prevent failover or communication between the CP blades during the replacement.

9. Use the **configUpload** command to upload the backbone configuration to a specified FTP server. Enter information at the prompts.

   a. Run the **fosconfig --show** command to determine if virtual fabrics are enabled. If so, run the **configupload -vf** command. This command uploads the Brocade DCX 8510-4 virtual fabric data.

   b. If virtual fabrics are not enabled, run the **configupload** command. This command uploads the Brocade DCX 8510-4 configuration.

Removing a control processor blade (CP8)

For this procedure, please refer to "ESD precautions" and Figure 22.

The chassis continues to operate while a CP blade is being replaced if the redundant CP blade is active and a failover does not occur. You can prevent failover by entering the **haDisable** command.

Complete the following steps to remove a CP8 control blade (CP).

1. Remove the chassis door.

2. Log in to the active CP as the admin user. You can use a serial cable or Telnet, Web Tools, or Fabric Manager. Determine which CP is active using the **haShow** command or view the active LED on the front of the CP.

3. If the faulty CP is the active CP, issue the **haFailover** command. Wait until the failover has completed. Use the **haShow** command to verify the CPs are synchronized and the failover is complete.

   Depending on the nature of the CP failure, it is possible that the **haFailover** command may not work. Proceed to the next step anyway.

4. Enter the **haDisable** command. This is required before physically removing and replacing a CP blade.

5. Power off the blade by sliding the slider switch in the left ejector to the right to the off position. Do not eject the blade until the power LED is off and you have completed the next two steps.

6. Disconnect all cables from the faulty (standby) CP.

7. Unscrew the thumb screw from both ejectors using the Phillips screwdriver.

8. Lever open both ejector handles simultaneously to approximately 45 degrees and pull the CP blade out of the chassis.

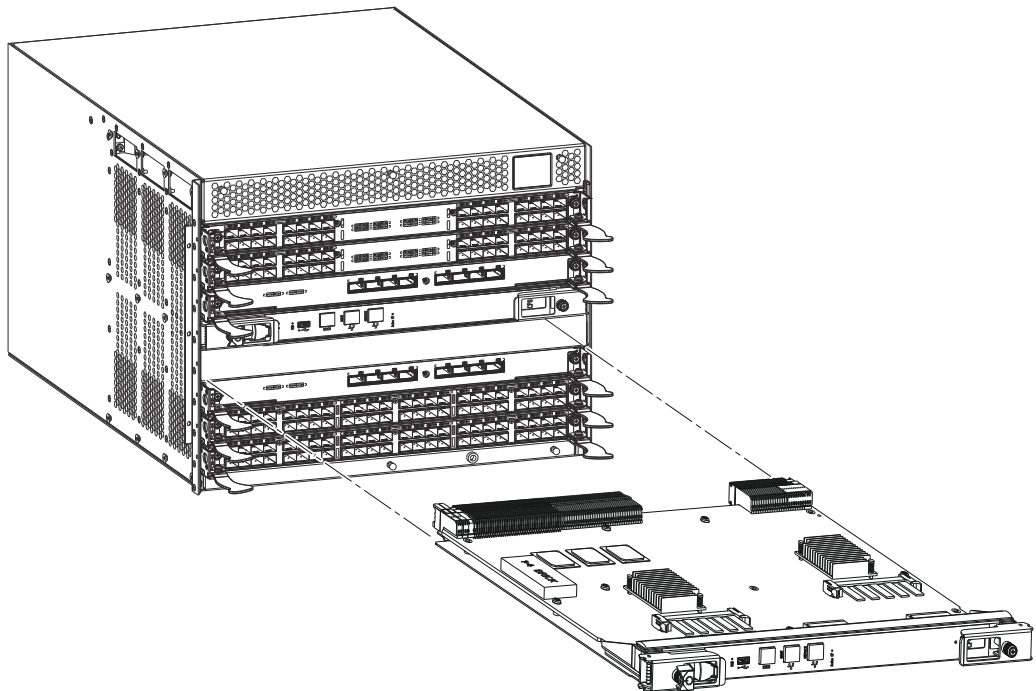**FIGURE 22**   Removal and replacement of the control processor blade (CP8)

Replacing a control processor blade (CP8)

⚠ **CAUTION**

Please read ALL of the instructions for replacing the CP blade before beginning the procedure. Use the same version of Fabric OS on both CP blades. Using different versions is not supported and may cause malfunctioning. If the replacement CP blade has a different version of Fabric OS,

bring both blades to the same firmware version. Once you have installed the replacement CP blade, see "Verifying operation of the new CP blade" for information about determining the version of firmware on the replacement CP blade and upgrading it if necessary.

For this procedure, please refer to "ESD precautions" and Figure 22.

Complete the following steps to remove a CP8 control blade (CP).

1. Open the ejector handles to approximately 45 degrees. Orient the CP blade so that the handles are toward you and the flat metal side is on your left.

2. Align the flat metal side of the CP blade inside the left and right blade guides in the slot. Slide the CP blade into the slot until it is firmly seated.

3. Tighten the thumb screw inside each handle using the Phillips screwdriver.

4. Turn the CP blade on by sliding the ON/OFF switch in the left handle to the left, to cover the thumb screw.

5. Verify that the power LED is green. If not, ensure that the CP blade has power and is firmly seated and that the ejectors are in the locked position.

6. Connect the cables to the new CP blade.

7. Remain logged in to the active CP and continue to "Verifying operation of the new CP blade."

Verifying operation of the new CP blade

To verify that boot and POST are complete on the new CP blade and that the CP blade has achieved failover redundancy, perform the following steps.

1. Type **slotShow**. The command output shows the new CP blade as "enabled."

    If the standby CP is unresponsive, you can try unplugging the new CP blade, running haDisable on the active CP blade, and plugging the new CP blade back in. At that point, you can repeat step 1 above to begin the verification process again.

2. Determine the version by entering **firmwareShow**. If the serial console on the replacement CP blade is connected, issue the **firmwareShow** command there. More information is available through the console.

    NOTE
    The DCX 8510-4 requires Fabric OS 7.0.0 or later to be recognized. If the firmware on the replacement blade is earlier than 7.0.0 it must be brought up to the version on the active CP blade, which must be at least 7.0.0.

3. If the firmware versions for both CP blades are the same, skip to "Complete the replacement."

    If the firmware version on the replacement blade does not match that on the active CP blade, a warning message appears with the results of the **firmwareshow** command. The results of the **firmwareshow** command may look similar to the following. Note the warning message at the end of the output.

```
DCX_xyz:admin> firmwareshow
Slot Name      Appl     Primary/Secondary Versions              Status
----------------------------------------------------------------------
   4 CP0       FOS      v7.0.0                                   ACTIVE
```

```
                        v7.0.0
  5 CP1     FOS      v6.3.0a                                    STANDBY *
                        v6.3.0a
*  Local CP

WARNING: The local CP and remote CP have different versions
of firmware, please retry firmwaredownload command.
```

4. You must bring the replacement blade to the same firmware level as the active blade by running the **firmwareDownload -s** command *directly on the replacement blade* to bring it up to the proper level. The **firmwareshow** command results show which slots hold the active and standby (replacement) CP blades.

    If you are using an FTP server to download the firmware, skip to "Downloading firmware from an FTP server."

    If you are using a USB device to download the firmware, skip to "Downloading firmware from a USB device." If the firmware on the standby CP blade is more than one level down from the level on the active CP blade, you must have formatted USB devices for each of the versions you will need to upgrade.

Table 9 shows the steps for upgrading from Fabric OS version 7.0.0.

TABLE 9   Steps for upgrading through multiple versions of Fabric OS

If you are at Fabric OS version	and your target version is	do these upgrade steps
7.0.0x	7.0.1	use firmwaredownload -s to upgrade directly to 7.0.0x

Downloading firmware from an FTP server

For this task, refer to Table 9 for the correct sequence of upgrading firmware versions to reach your target version.

Complete the following steps to download the firmware from an FTP server.

1. Log in to the standby CP blade as **admin**. If you need to know the IP address of the standby blade, run **ipaddrshow**.

    You should remain logged in to the active CP blade in order to monitor it.

2. Run **firmwareDownload -s** to download the firmware to the standby CP blade. The **-s** option also disables the autoreboot, so you will have to manually issue a reboot after the download finishes to initiate firmwarecommit. Enter all requested information (use default values).

3. When the download process finishes, run **firmwareDownloadStatus** to verify that the firmware has been updated.The command displays a running account of the progress of the **firmwareDownload** command (if it is still running) until the command has completed. The final message is similar to the following and will appear with a date and time stamp:

    ```
    Slot 4 (CP0, active): Firmwaredownload command has completed successfully. Use
    firmwareshow to verify the firmware versions.
    ```

4. On the standby CP blade (the blade for which you just changed the firmware level), run **reboot**. The reboot of the standby CP will initiate a **firmwarecommit** to the secondary partition and log you out.

```
DCX_124:admin> reboot
Broadcast message from root (ttyS0) Fri Jun 18 14:49:45 2010...
The system is going down for reboot NOW !!
INIT: Switching to runlevel: 6
INIT: Sending processes the TERM signal DCX_124:admin> HAMu Heartbeat down,
stop FSS
Unmounting all f##exiting due to signal: 9, pending signals: 0x20000, 0x0

ilesystems.
Please stand by while rebooting the system...
Restarting system.
The system is coming up, please wait...
.
.
.
Fri Jun 18 14:53:13 2010: Doing firmwarecommit now.
Please wait ...
Fri Jun 18 14:55:27 2010: Firmware commit completes successfully.
Validating the filesystem ...
Fri Jun 18 22:36:05 2010: Doing firmwarecommit now.
Please wait ...
Fri Jun 18 22:36:48 2010: Firmware commit completes successfully.
2010/06/18-14:56:50, [SULB-1004], 908, SLOT 7 | CHASSIS, INFO, Brocade_DCX,
Firmwarecommit has completed.
2010/06/18-14:56:50, [SULB-1036], 909, SLOT 7 | CHASSIS, INFO, Brocade_DCX,
The new Version: Fabric OS v6.3.0c

2010/06/18-14:56:50, [SULB-1002], 910, SLOT 7 | CHASSIS, INFO, Brocade_DCX,
Firmwaredownload command has completed successfully.
```

NOTE
The time stamp on the co-cpu may not be in sync with the main cpu on the blade. This is not a cause for concern.

5. Log back in to the standby CP blade and run **firmwareDownloadStatus** on the standby CP blade to validate a successful commit. This may take 10 minutes.

6. If you are upgrading through several levels of the Fabric OS, repeat step 2 through step 5 as often as necessary based on the path outlined in the table above. Otherwise, proceed to step 7.

7. Log out of the standby CP blade and log in to the active CP blade.

8. Proceed to "Completing the replacement."

Downloading firmware from a USB device

For this task, refer to Table 9 for the correct sequence of upgrading firmware versions to reach your target version.

Complete the following steps to download the firmware from a USB device.

This section assumes that the new firmware has already been copied onto the USB device. The folder structure on the USB device must be as follows in order to allow the device to be enabled:

- brocade>
  - config

- firmware
- firmwareKey
- support

The firmware folder contains the folder for the specific release you are installing.

1. Insert the USB device into the active CP blade.

2. Attach a serial cable from the PC to the active CP blade.

3. Log in to the active CP blade as **admin** if you are not still logged in and enter **usbStorage -e** to enable the USB device.

4. Remove the serial cable from the active CP blade and attach it to the standby CP blade and log in as **admin**.

5. Run **firmwareDownload -s** to download the firmware to the standby CP blade. The **-s** option also disables the autoreboot, so you will have to manually issue a reboot after the download finishes to initiate firmwarecommit. Enter all requested information (use default values).

6. This does not apply to the DCX 8510 models.When the download process finishes, run **firmwareDownloadStatus** to verify that the firmware has been updated. The command displays a running account of the progress of the **firmwareDownload** command until the command has completed. The final message is similar to the following and will appear with a date and time stamp:

```
Slot 4 (CP0, active): Firmwaredownload command has completed successfully. Use
firmwareshow to verify the firmware versions.
```

7. Ensure that you are still logged in to the standby CP blade (the blade for which you just changed the firmware level) and type **reboot**. The reboot of the standby CP will initiate a **firmwarecommit** to the secondary partition and log you out.

```
DCX_124:admin> reboot
Broadcast message from root (ttyS0) Fri Jun 18 14:49:45 2010...
The system is going down for reboot NOW !!
INIT: Switching to runlevel: 6
INIT: Sending processes the TERM signal DCX_124:admin> HAMu Heartbeat down,
stop FSS
Unmounting all f##exiting due to signal: 9, pending signals: 0x20000, 0x0

ilesystems.
Please stand by while rebooting the system...
Restarting system.
The system is coming up, please wait...
.
.
.
Fri Jun 18 14:53:13 2010: Doing firmwarecommit now.
Please wait ...
Fri Jun 18 14:55:27 2010: Firmware commit completes successfully.
Validating the filesystem ...
Fri Jun 18 22:36:05 2010: Doing firmwarecommit now.
Please wait ...
Fri Jun 18 22:36:48 2010: Firmware commit completes successfully.
2010/06/18-14:56:50, [SULB-1004], 908, SLOT 7 | CHASSIS, INFO, Brocade_DCX,
Firmwarecommit has completed.
2010/06/18-14:56:50, [SULB-1036], 909, SLOT 7 | CHASSIS, INFO, Brocade_DCX,
The new Version: Fabric OS v6.3.0c
```

```
2010/06/18-14:56:50, [SULB-1002], 910, SLOT 7 | CHASSIS, INFO, Brocade_DCX,
Firmwaredownload command has completed successfully.
```

NOTE
The time stamp on the co-cpu may not be in sync with the main cpu on the blade. This is not a cause for concern.

8. Log back in to the standby CP blade and type **firmwareDownloadStatus** on the standby CP blade to validate a successful commit. This may take 10 minutes.

9. If you are upgrading through several levels of the Fabric OS, repeat step 5 through step 8 as often as necessary based on the path outlined in the table above. Otherwise, proceed to step 10.

10. Log out of the standby CP blade and log in to the active CP blade.

11. Proceed to

Completing the replacement

Complete the following steps to complete the CP8 control blade replacement procedure.

1. Type **haEnable** to re-enable HA on the active CP blade.

NOTE
For Fabric OS 6.3.0 and later, **haEnable** will cause the standby CP blade to reboot. Wait until POST completes before moving to the next step. POST is complete when the Status LED on the CP blade returns to a steady green state.

2. Type **haShow** and verify that the command output includes "HA Enabled, Heartbeat Up". If it is not yet enabled, re-enter the command until you have verified that redundancy is achieved.

```
DCX_124:admin> hashow
Local CP (Slot 7, CP1) : Active
Remote CP (Slot 6, CP0) : Standby, Healthy
HA Enabled, Heartbeat Up, HA State Synchronized
```

3. Type **firmwareShow** to verify that the firmware version has been updated and that the versions are the same on the two CP blades. The slot numbers will be different for the DCX 8510-4 or DCX-4S. (not all slot numbers are shown)

```
DCX_8510:admin> firmwareshow

Slot Name     Appl     Primary/Secondary Versions   Status
-----------------------------------------------------------

  4   FX8-24  FOS      v7.0.0
                       v7.0.0
  6   CP0     FOS      v7.0.0                        STANDBY
                       v7.0.0
  7   CP1     FOS      v7.0.0                        ACTIVE *
                       v7.0.0
 10   FX8-24  FOS      v7.0.0
                       v7.0.0
```

4. Pack the faulty CP blade in the packaging provided with the new CP blade, and contact the switch supplier to determine the return procedure.

5. Replace the chassis door.

If you have one or more application blades in the chassis, the Fabric OS automatically detects mismatches between the active CP firmware and the application blade's firmware and triggers the auto-leveling process. This auto-leveling process automatically updates the application blade firmware to match the active CP. At the end of the auto-leveling process, the active CP and the application blades will run the same version of the firmware.

Core switch blade (CR16-4) removal and replacement

This section describes how to remove and replace a core switch blade (CR16-4). The Brocade DCX 8510-4 has two core switch blades: one in slot 3 and one in slot 6. Note that the blade shown in the removal illustration (Figure 23) is shown with EMI plugs installed.

Time and items required

The replacement procedure for the core switch blade takes approximately 30 minutes. The following items are required for the core switch blade replacement:

*   ESD (electrostatic discharge) grounding strap.
*   Phillips #2 screwdriver.
*   Replacement core switch blade

Faulty core switch blade indicators

Confirm that you need to replace the core switch blade before continuing. The following events might indicate that a core switch blade is faulty:

*   The status LED on the core switch blade is lit steady amber, or the power LED is not lit.
*   The **slotShow** command does not show that the core switch blade is enabled.
*   The **haShow** command indicates an error.
*   Any of the following messages display in the error log:
    -   "Slot unknown" message relating to a core switch slot
    -   Core switch blade errors or I^2C timeouts
    -   FRU: FRU_FAULTY messages for a core switch blade
    -   Configuration loader messages or "Sys PCI config" messages
    -   Generic system driver messages ("FABSYS")
    -   Platform system driver messages ("Platform")
    -   EM messages that indicate a problem with a core switch blade
    -   Function fail messages for the core switch master

For more information about error messages, refer to the *Fabric OS Message Reference*.

Removing a core switch blade (CR16-4)

The Brocade DCX 8510-4 continues to operate while a core switch blade is being replaced. Refer to Figure 23 for the following procedure.

Complete the following steps to remove the core switch blade.

ATTENTION
Follow ESD precautions.

NOTE
The CR16-4 blade is compatible only with the Brocade DCX 8510-4.

---

1. Remove the chassis door.

2.   Unscrew the two thumb screws from the ejectors on the blade using the Phillips screwdriver. Unscrew the left thumb screw until it pops out. This initiates a hot-swap request.

3. Label and then disconnect cables from the faulty core switch blade.

4. Open the ejectors by rotating them toward the center of the blade face. Pull the blade out of the chassis using the ejectors.
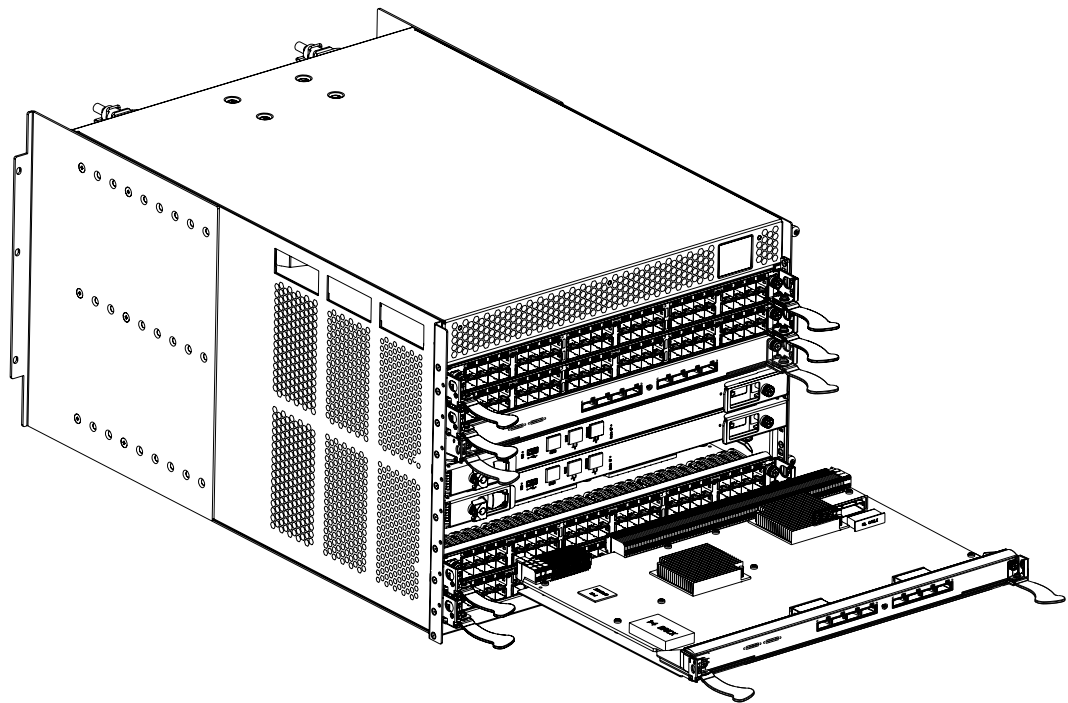
FIGURE 23   **Removal and replacement of the core switch blade (CR16-4)**

Replacing a core switch blade (CR16-4)

Complete the following steps to replace the core switch blade.

ATTENTION

Follow ESD precautions.

NOTE

The CR16-4 blade is compatible only with the Brocade DCX 8510-4.

---

1. Open the ejectors by rotating them toward the center of the blade face. Orient the CR blade so that the handles are toward you.

2. Align the flat side of the blade inside the left and right rail guides in the slot with the components facing upwards, and slide the blade into the slot until it is firmly seated.

3. Close the ejectors by rotating them away from the center of the blade. The levering action of the ejectors seats the blade in the slot.

4. Power on the blade by screwing in the thumbscrews.

5. Verify that the power LED is green (might require a few seconds). If not, ensure that the core switch blade has power and is firmly seated and that the ejectors are in the locked position.

6. The status LED on the new blade is initially amber and will be until POST for the blade completes. this may take as long as several minutes. It then turns green.

7. Connect the cables to the new core switch blade. For the 8510 models, if the QSFP cables are not used, make sure the rubber gaskets are in the QSFP transceivers.

8. Replace the chassis door.

9. Pack the faulty core switch blade in the packaging provided with the new core switch blade, and contact the Brocade DCX 8510-4 supplier to determine the return procedure.

Power supply removal and replacement

Use this procedure to remove and replace a power supply.

NOTE

The Brocade DCX 8510-4 can continue operating during the replacement if the second 220 VAC power supply is operating. If the Brocade DCX 8510-4 is supplied with 110 VAC (nominal), there is a risk of some blades being powered off for lack of power during the replacement.
This is why Brocade always recommends using 220 VAC (nominal).
Brocade DCX 8510-4 power supplies are 100-240 VAC, auto-sensing.

Time and items required

The replacement procedure for each power supply takes less than five minutes. A power supply unit or filler panel is required for the power supply replacement.

Identifying power supplies

Figure 24 shows the location and identification of the power supplies.

| 1 | Power supply 1 (PS1) | 2 | Power supply 2 (PS2)) |

FIGURE 24   **Power supply identification**

Removing a power supply

For the following procedure, refer to Figure 25.

To remove a power supply, complete the following steps.

1. Perform the appropriate following action based on whether the Brocade DCX 8510-4 is operating:

    - If the Brocade DCX 8510-4 is not operating during the replacement procedure, go to step 2.

    - If the Brocade DCX 8510-4 is operating and will continue to operate during the replacement, check the power LEDs to verify that the minimum number of power supplies is functioning. See Providing power to the Brocade DCX 8510-4 in the Installation chapter of your Hardware Reference Manual to check your power requirements.

2. Turn off the power switch.

3. Unlatch the power cord retainer clip.

4. Remove the power cord.

5. Loosen the thumbscrew.

6. Grasp the handle and pull, sliding the power supply from the chassis and supporting the power supply from beneath as you remove it.
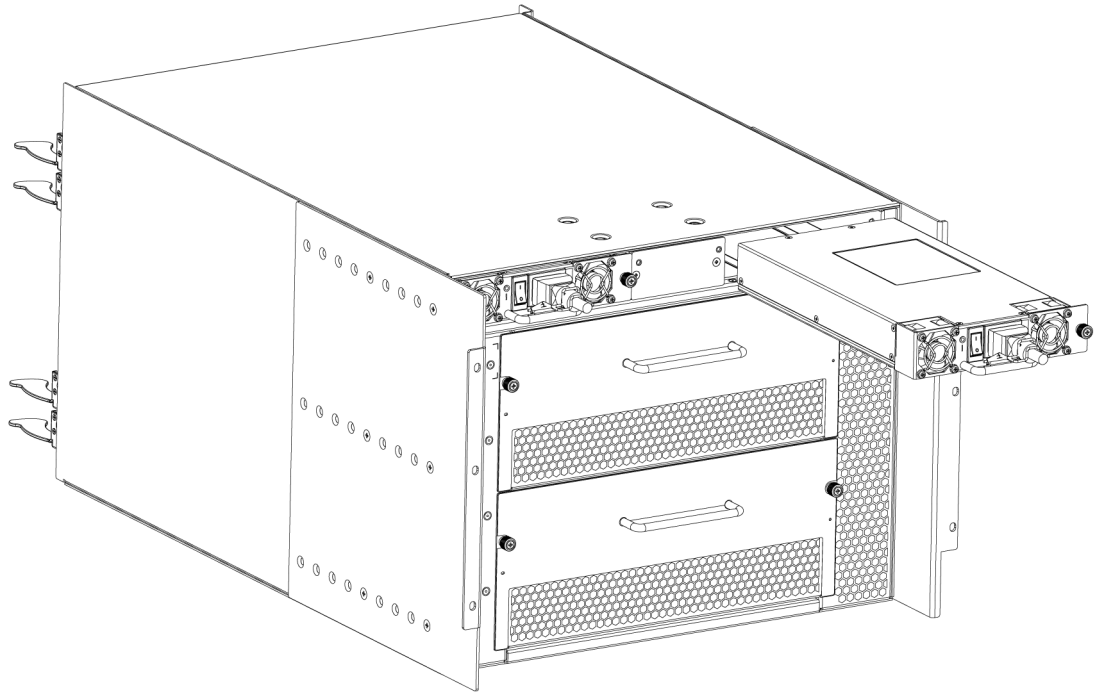
FIGURE 25   Removal and replacement of the power supply

Replacing a power supply

To replace a power supply, complete the following steps.

1. If you are not replacing the power supply, insert a filler panel into the slot.

2. Otherwise, insert the power supply into the slot. Verify that the power supply is seated by gently pulling on the handle.

3. Tighten the thumb screw.

4. Replace the power cord.

5. Latch the power cord retainer clip.

6. Turn on the power switch.

7. Verify that the power LED on the power supply displays a steady green light.

Blower assembly removal and replacement

Use this procedure to remove and replace a blower assembly.

ATTENTION

The Brocade DCX 8510-4 can continue operating during the replacement if the second blower assembly is operating,

To ensure continuous adequate cooling, maintain two operating blower assemblies at all times except for the brief period when replacing a blower assembly.

Time and items required

The replacement procedure for each blower assembly takes less than 5 minutes. The following items are required for the blower assembly replacement:

- Replacement blower assembly
- #2 Phillips screwdriver

Removing a blower assembly

For the following procedure, refer to Figure 26.

Complete the following steps to remove a blower assembly from the chassis.

1. Before removing a blower assembly, verify that the other blower assemblies are functioning correctly. The power LEDs should be steady green.

2. Use the screwdriver to loosen the captive screws at the ends of blower assembly.

3. Grasp the handle and pull, sliding the blower assembly from the chassis and supporting the blower assembly from beneath as you remove it.
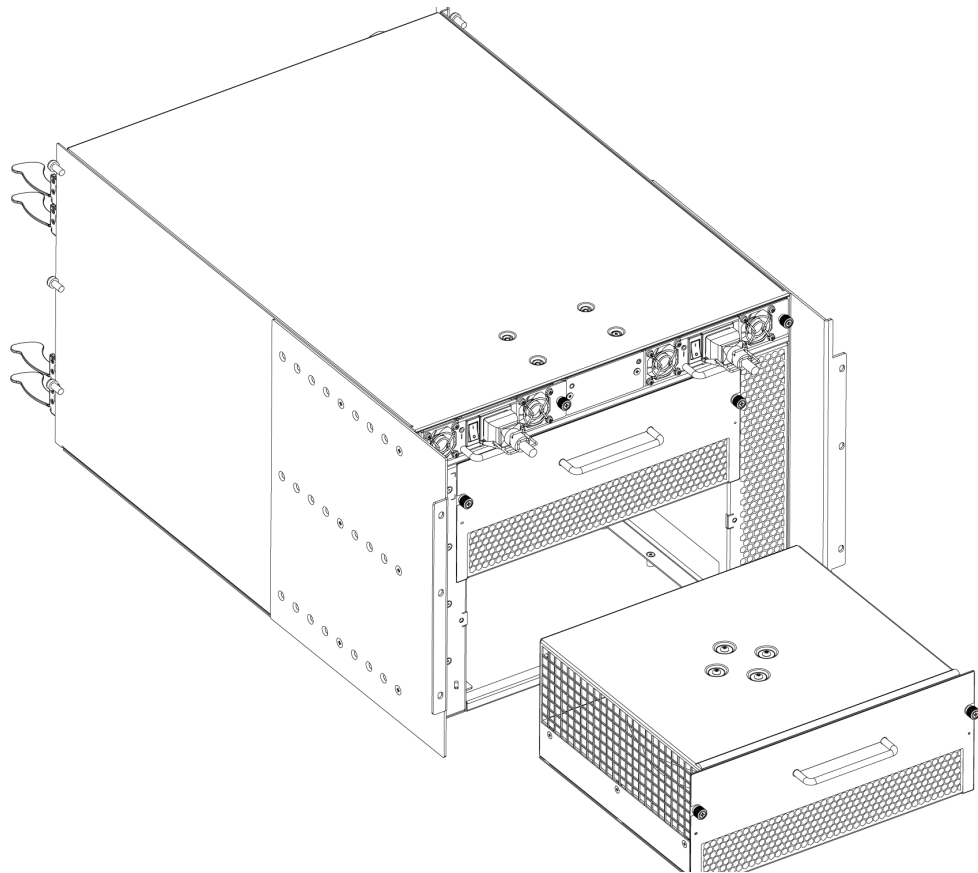
FIGURE 26 Removal and replacement of the blower assembly

Replacing a blower assembly

Complete the following steps to replace the blower assembly in a chassis.

1. Orient the blower assembly and slide it into the chassis, pushing firmly to ensure that it is seated.

2. Verify that the power LED displays a green light.

3. Use the screwdriver or your fingers to tighten the captive screws.

WWN card removal and replacement

Use this procedure to remove and replace a WWN card.

NOTE
The World Wide Name (WWN) cards contain fully redundant circuits and normally do not require replacement. Two WWN cards are located beneath the WWN bezel (logo plate).

Time and items required

Allow approximately 20 minutes to replace a WWN card. The following items are needed to replace a WWN card:

*   Electrostatic discharge (ESD) grounding strap
*   #2 Phillips screwdriver (required only for some versions of the WWN card)
*   If a serial console session is used: serial cable and a workstation computer with a terminal emulator application (such as HyperTerminal for Windows systems or TIP for Solaris systems)

Verifying the need for replacement

Before replacing a WWN card, verify that the replacement is necessary. Any of the following events can indicate that the card requires replacement:

*   Power or Status LEDs on WWN card (beneath logo plate) indicate a problem
*   Problems viewing or modifying the data stored on the WWN card
*   Error messages regarding WWN units #1 or #2

Preparing for the WWN card replacement

If the WWN card requires replacement, complete the following steps.

ATTENTION
Follow ESD precautions (see "ESD Precautions" in your chassis manual).

1. Open a Telnet session to the chassis and log in to the active CP as admin. The default password is "password".

2. Verify that you are logged into the active CP. Run the **haShow** command to determine the active CP.

3. Run the supportsave command on the active CP to capture all settings.

4. Contact Brocade Technical Support for a replacement WWN card. Technical Support will require the supportsave data collected in the previous step so that a replacement can be programmed prior to shipping to your location.

    DO NOT execute the **frureplace** command. The command will no longer be functional beginning with the release of Fabric OS 7.0.0c, but users with earlier versions of the Fabric OS should also NOT run the command.

Removing the WWN bezel (logo plate) and WWN card

For the following procedure, please refer to Figure 27.

When the replacement WWN card has been received, complete the following steps to remove the bezel and faulted WWN card.

ATTENTION

Follow ESD precautions (see "ESD Precautions" in your chassis manual).

---

1. Open a Telnet session to the chassis and log in to the active CP as admin. The default password is "password".

2. Verify that you are logged into the active CP. Run the **haShow** command to determine the active CP.

3. Run the supportsave command on the active CP to capture all settings. If any problems occur during the replacement, the information will be important for solving the problem.

4. Remove the screws from the WWN bezel. Pull the bezel away from chassis and set it aside. The WWN cards are visible.

5. Use a Phillips screwdriver to unscrew the two screws that secure the WWN card to the chassis. Hold the card by the edges and remove it.

6. Disconnect the WWN cable by depressing the cable connector latch and pulling the connector from the WWN module.

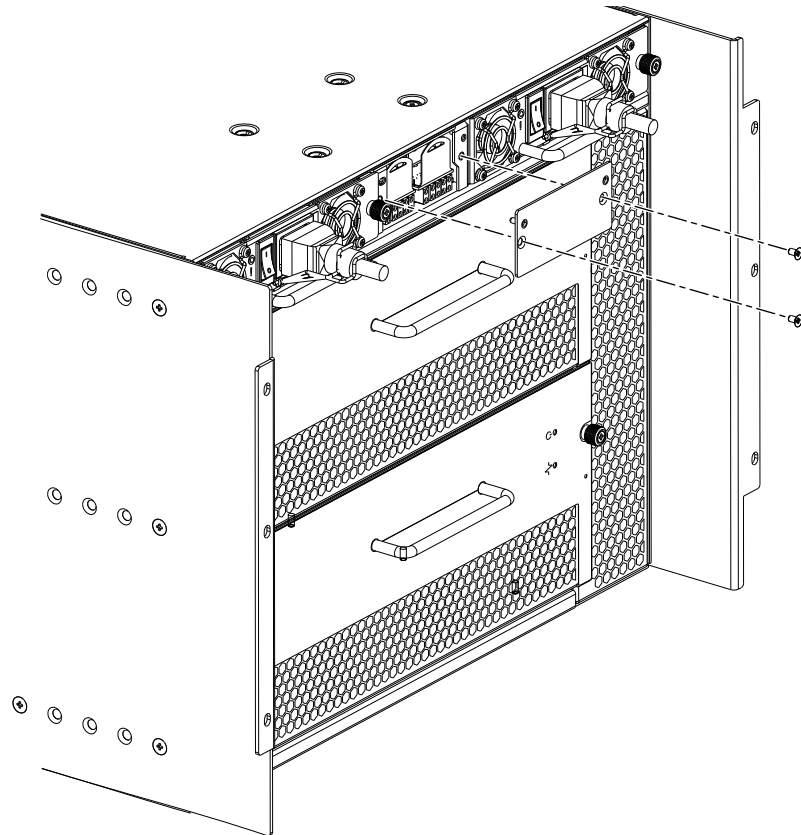7. Set the WWN card on a static-free surface, such as a grounding pad.

FIGURE 27   Removal and replacement of the WWN bezel (logo plate) and WWN card

Replacing the WWN card and WWN bezel (logo plate)

For the following procedure, please refer to Figure 27.

Complete the following steps to replace the bezel and WWN card.

ATTENTION
Follow ESD precautions (see "ESD Precautions" in your chassis manua).

---

1. Unpack the new WWN card and save the packaging for the faulty WWN card.

2. Hold the card by the edges and insert the WWN cable onto the WWN module until it is fully seated. Use the Phillips screwdriver and the two screws to attach the WWN card to the chassis.

   NOTE
   If a serial console session is active, several "removal detected" and "insertion detected" messages display on the console because of the replacement.

   ---

3. Verify that the WWN card is correctly connected by checking the LEDs on the WWN card to see if they reflect the status of the components.

   NOTE
   The LEDs might take up to 2 minutes after WWN card installation to begin functioning.

   ---

4. Install the WWN bezel. Orient the bezel on the chassis. Insert and tighten the screws.

5. Pack the faulty WWN card in the packaging provided with the new card and return it to the chassis supplier.

Transceiver removal and replacement

Use this procedure to remove and replace a transceiver.

NOTE
The 16 Gbps-capable SFP+s auto-negotiate at 4, 8, and 16 Gbps.The single-speed 10 Gbps SFP+s can also be used in the 16 Gbps port blades. The 8 Gbps-capable mSFPs and SFP+s auto-negotiate at 2, 4, and 8 Gbps. The mSFPs are compatible only with the FC8-64 high density port blade. The 16 Gbps SFP+s should be used only with the FC16-32 and FC16-48 port blades.

Time and items required

The replacement procedure for one transceiver takes less than five minutes.

- Replacement mSFP SFP+,
- Optical transceiver extraction tool (for SFP+ transceivers)

Most Brocade switches and backbones come with a transceiver extraction tool (Figure 1) and holster. The extraction tool is designed to remove transceivers from switches and blades where the space is limited.
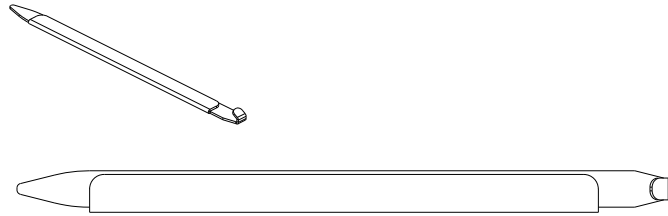
FIGURE 28   Optical transceiver (SFP+) extraction tool

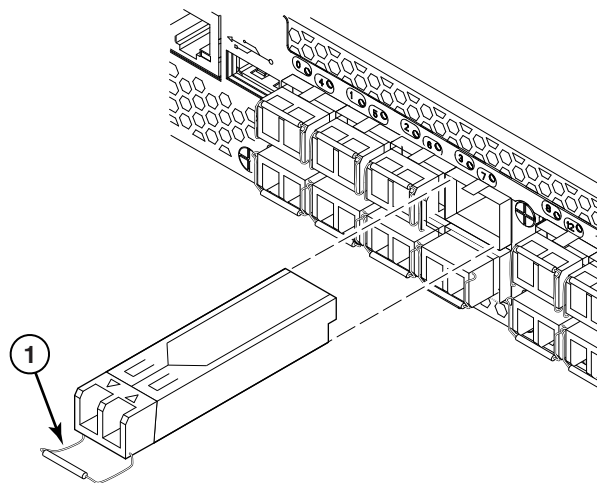## Removing an SFP+ transceiver

For this procedure, please refer to Figure 29.

Complete the following steps to remove an SFP+ transceiver.

1. Remove any cables that are inserted into the transceiver. Use the extraction tool to open the cable latching mechanism.

2. Using the hooked end of the tool, pull the bail (wire handle) away from its pivot point and out, sliding the transceiver out of the switch or blade.

   The 16 Gbps SFP+ transceivers have an attached pull tab like the mSFPs. Instead of using the tool, simply grasp the pull tab and pull straight out to remove the 16 Gbps SFP+ from the switch or blade. See the illustration for the mSFP transceiver for the basic appearance of the 16 Gbps transceiver.

1   Bail

FIGURE 29   Optical transceiver with bail open

Replacing an SFP+ transceiver

Complete the following steps to replace an SFP+ transceiver.

1. Making sure that the bail (wire handle) is in the unlocked position, position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks; then close the bail.

    The 16 Gbps SFP+ transceivers do not have bails. Use the tab on the 16 Gbps SFP+ transceivers to help gently push the transceiver into the port. Do not push so hard as to bend the tab.

    Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

    Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented. Do not insert a cable intended for an mSFP transceiver into a regular SFP+ transceiver. You may damage the cable. Do not force a standard SFP cable into an mSFP transceiver. You may damage the transceiver.

Removing and replacing an mSFP optical transceiver

Use this procedure to remove and replace mSFP transceivers. Do not use the extraction tool to remove the transceivers.

NOTE
The mSFP transceivers are used only with the FC8-64 port blade. Narrower OM-3 LC cables are used to connect the FC8-64.

NOTE
It is recommended that the optical cable should be either removed from or inserted into the mSFP while the transceiver is out of the blade due to the port density.

ATTENTION
mSFP optical transceivers should not be inserted into ports intended for SFP+ transceivers. They will be faulted on power-up For Fabric OS 6.4.0 and later.

NOTE
Cables for mSFP transceivers should not be used with standard SFP+ transceivers.
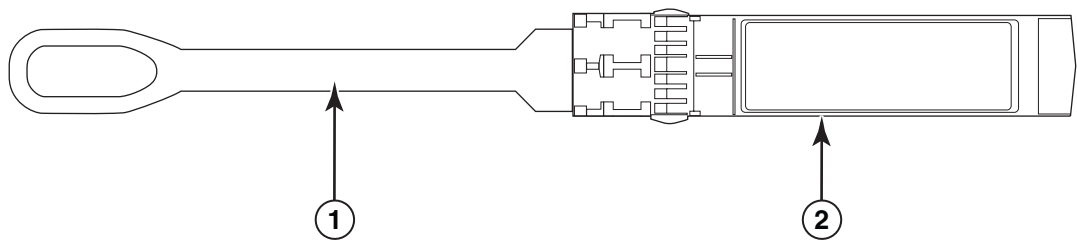
⚠ **CAUTION**

The pull tabs are not designed to be bent. Doing so may result in damage to the pull tab.

Removing an mSFP transceiver

For this procedure, refer to Figure 30.

Complete the following steps to remove an mSFP transceiver.

1. Grasp the pull tab firmly and pull the unit out of the port.

2. Remove the cable from the transceiver.

1	Pull tab	2	mSFP transceiver

FIGURE 30   **Optical mSFP transceiver**

Replacing an mSFP transceiver

For this procedure, refer to Figure 30.

Complete the following steps to replace an mSFP transceiver.

1. Insert the cable into the new transceiver until the latching mechanism clicks.

2. Position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

Inter-chassis link (QSFP) cable removal and replacement

Use this procedure to remove and replace a QSFP cable.

NOTE
The QSFP ports can be used only with an inter-chassis link (ICL) license. After the addition or removal of a license, the license enforcement is performed on the ports only when the **portdisable** and **portenable** commands are issued on the ports. An ICL license must be installed on all Brocade Backbones forming the ICL connection. Beginning with Fabric OS v7.0.1, up to nine neighboring Brocade 8510 series chassis can be connected with the QSFP cables. Under Fabric OS v7.0.0, six chassis can be connected.

NOTE
For the Brocade 8510 Backbones, an off-the-shelf QSFP cable up to 50 meters long can be used as an ICL cable.

ATTENTION
For the 8510 series models, if the QSFP cables are not used, make sure the rubber gaskets are in the QSFP transceivers.

Table 10 describes the connector port LED patterns and the recommended actions for those patterns.

TABLE 10 QSFP connector port LEDs

LED purpose	Color	Status	Recommended action
QSFP connector status	No light (LED is off)	No QSFP module, all four QSFP ports are disabled	No action required if QSFP no present or verify that the QSFP is fully inserted.
	Steady amber	QSFP module is in, all four ports have no signal/no sync.	No action required if QSFP only is installed or ensure that the cable is properly connected. If the LED remains amber, consult the Brocade DCX 8510-4 supplier.
	Blinking amber	Port is disabled or faulted, FC link activity, segmented, loopback mode, also during transition between QSFP cable insertion and confirmation.	Check for console messages or wait for all four ports to come online.
	Steady green	Both ends of QSFP cable are in and all ports are online. Full link is established.	No action required.

Follow this procedure to install the QSFP cables. Refer to the *Fabric OS Administrator's Guide* for the configuration procedure and requirements.

Figure 31 shows an QSFP cable and transceiver. The QSFP connectors on the core blades are labeled by trunk group (trunking is optional) for ease of installation. The subsequent figures shows acceptable cabling configurations for the ICL feature. The recommended topology is the parallel type where there are four QSFP cables connected between any pair of Brocade 8510 series chassis.The full mesh configuration is also supported.
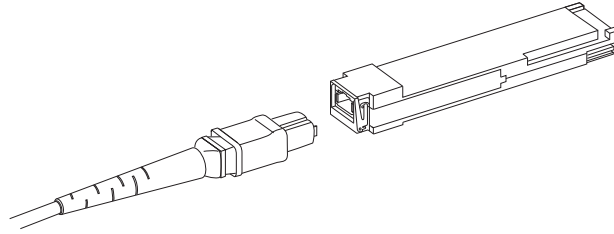
FIGURE 31   QSFP cable and transceiver

Time and items required

The replacement procedure for an QSFP cable takes less than five minutes.

You will need a replacement QSFP cable and transceiver (if necessary).

Removing an ICL cable

For the following procedure, refer to Figure 32.

Complete the following steps to remove a QSFP cable.

1. Grasp the rubber housing on the end of the cable and pull it straight out of the QSFP transceiver.

2. If the QSFP transceiver also needs to be replaced, remove the QSFP transceiver by rotating the bail down and using the bail to pull the transceiver out of the connector on the blade.

3. Repeat for each cable that requires replacement.
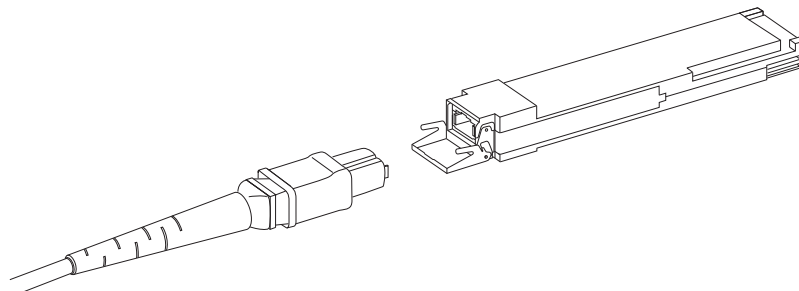
| 1 | QSFP transceiver | 2 | Bail |

FIGURE 32   QSFP transceiver (bail open)

Replacing an ICL cable

Complete the following steps to replace a QSFP cable.

1. If the QSFP transceiver is being replaced, grasp the bail of the new QSFP and push the QSFP into the connector on the blade until it is firmly seated. The QSFP is keyed to fit into the connector in one way. The status LED initially blinks amber after installation, then displays steady amber.

2. Grasp the QSFP cable by the rubber housing and push it into the QSFP transceiver until it is firmly seated. The cable housing is keyed to fit into the QSFP in one way.

   The status LED displays steady amber until both ends of the cable are inserted and the link is established. When the link is fully established, the LED displays steady green.

3. Repeat for each cable that requires replacement.

4. Once all the cables are attached, see the *Fabric OS Administrator's Guide* for the configuration procedure.

Possible ICL configurations

Figure 33 illustrates one possible QSFP cable configuration between two 8510 series chassis. Each of two cores in one chassis should be interconnected with each of two cores in the second chassis. This provides for inter-chassis link (ICL) trunking between chassis, ensuring redundancy. Parallel connections between core blades are recommended.

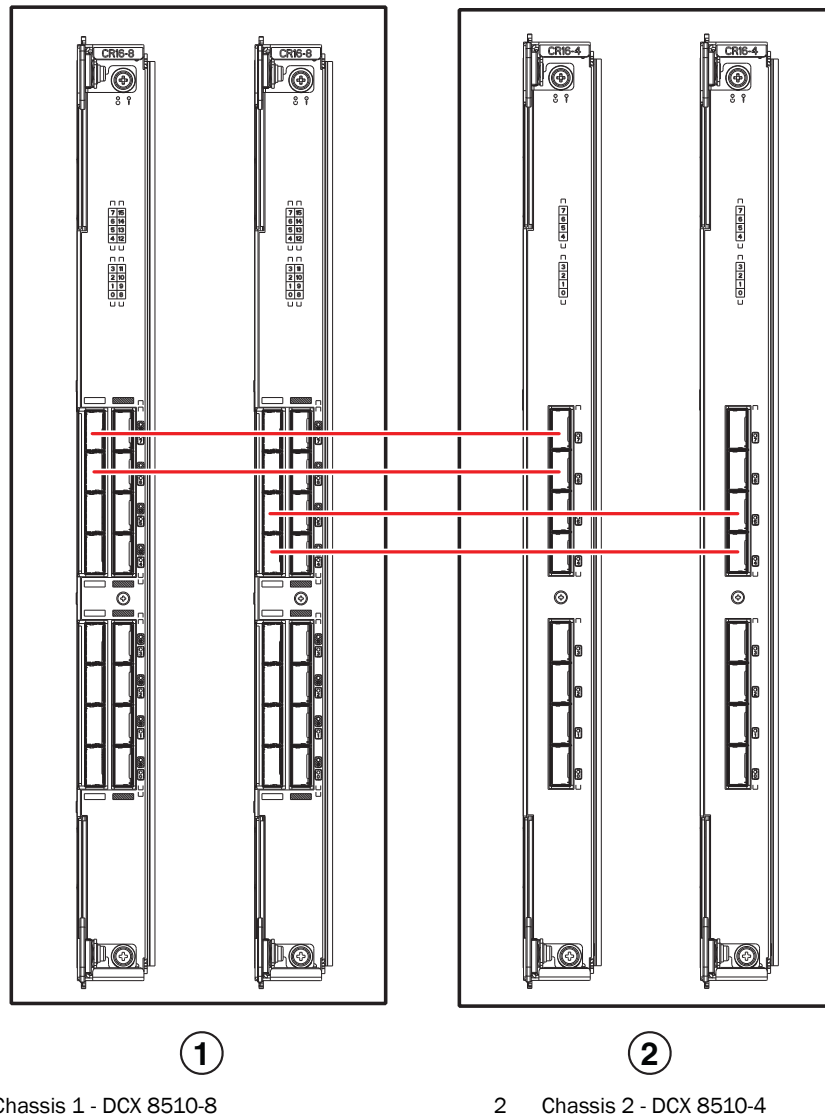| 1 | Chassis 1 - DCX 8510-8 | 2 | Chassis 2 - DCX 8510-4 |

FIGURE 33   QSFP cable connections for Brocade DCX 8510 chassis (sample configuration)

8510 chassis can be connected in a core/edge configuration. Figure 34 shows two core and four edge chassis. Although 8510-8 chassis are shown in the figure, the chassis can be either 8510-4 or 8510-8. The cabling scheme should follow the parallel example shown in the Figure 33. Each line in the example actually represents four cables running between the chassis.
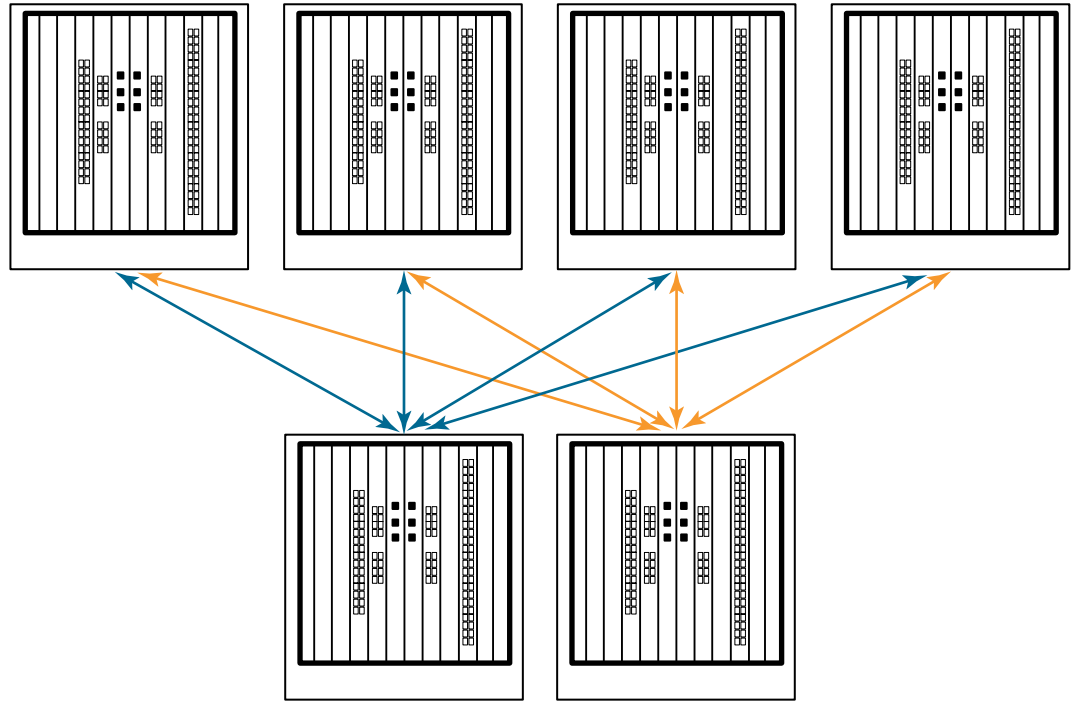
FIGURE 34   DCX 8510 core/edge ICL topology

8510 chassis can also be connected in a full mesh configuration as shown in Figure 35. Although 8510-8 chassis are shown in the figure, the chassis can be either 8510-4 or 8510-8. In this example, the trunk groups are shown in color.
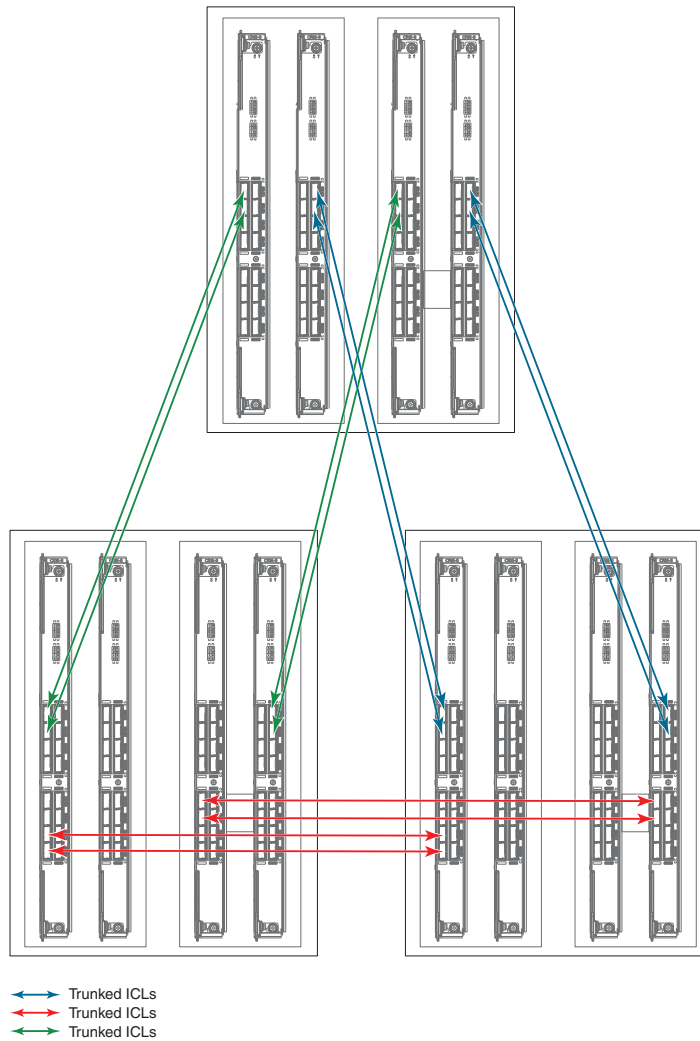

Trunked ICLs
Trunked ICLs
Trunked ICLs

FIGURE 35   DCX 8510 full mesh ICL topology

Brocade DCX 8510-4 chassis removal and replacement

This section describes how to remove and replace the Brocade DCX 8510-4 chassis (with its backplane). The basic steps are:

1. Faulty Brocade DCX 8510-4 chassis indicators

2. Recording critical Brocade DCX 8510-4 and SAN information

3. Disconnecting from the network and fabric

4. Removing components from the chassis

5. Installing the replacement chassis

6. Installing components into the new chassis

7. Verifying correct operation of the system

8. Reconnecting the system to the network and fabric

9. Verifying correct configuration of the fabric

NOTE
The Brocade DCX 8510-4 must be removed from the fabric and powered off to perform this procedure. Contact your support provider if you have any questions about whether the chassis requires replacement.

Time and items required

The chassis replacement takes approximately 3 hours.

The following items are required for the chassis replacement:

*   Electrostatic discharge (ESD) grounding strap
*   ESD grounding pads for protecting all blades and WWN cards
*   Serial cable and workstation computer with a terminal emulator application (such as HyperTerminal for Windows systems or TIP for Solaris systems), required only if serial console session used
*   Pallet jack or hydraulic or assisted lift that raises a minimum of 140 cm (55 in.) and carries a minimum of 113 kg (250 lb)
*   A surface on which to place the old chassis, such as a second lift or the pallet originally provided with the old chassis
*   #2 Phillips screwdriver

Faulty Brocade DCX 8510-4 chassis indicators

Verify that replacement of the chassis is necessary. Ensure that the components are firmly seated when troubleshooting, and contact your support provider with any questions about whether the chassis should be replaced.

Any of the following events might indicate the need to replace the chassis:

*   Visible mechanical damage to the chassis, including damage to sheet metal or card guides that prevents correct installation of a blade.
*   Bent or damaged connectors on the backplane (the surface inside the chassis to which the blades connect).
*   One or more components (such as a power supply, blower assembly, port blade, control processor blade, core switch blade, or WWN card) do not function properly even after the component was replaced.

- Intermittent FAULTY codes for blades. Re-seat the blade and visually inspect the right-hand ejector stiffening rail for possible wear or damage. It is important that the blade ejector handles not slip out during blade installation. If this happens, it is usually due to excessive wear or damage to the right-hand ejector stiffening rail.

- The **psShow** or **fanShow** commands continue to show a faulty component even though the component was replaced.

- The **slotShow** command continues to show a faulty control processor, core switch, or port blade even though the blade was replaced.

Recording critical Brocade DCX 8510-4 and SAN information

All commands must be entered from a CLI session (Telnet or serial) to the active CP blade unless otherwise indicated.

NOTE
Run **supportShow**, which includes most of the information in Table 1 and more. The customer should record the location of the .txt files, which are created by the customer in this procedure and are not called out in the **supportShow** results.

For detailed information about Fabric OS commands, refer to the *Fabric OS Command Reference Manual*. Use a checklist (Table 1) to ensure that all required information is recorded.

TABLE 11   Critical information checklist

Checked?	Data	Notes
Configuration information		
	Location of "config-switch.txt" file	
	Location of "config-miscinfo.txt" file	
	IP address, subnet mask	
	WWN for Brocade DCX 8510-4	
SAN profile		
	Location of "SANbefor.txt" file	
	Notes regarding **nsshow** output	
	Notes regarding **nsallshow** output	
	Notes regarding **switchshow** output	
	Notes regarding **fabricshow** output	
Output from supportshow command		
	Location of "spptshow.txt" file	
	Notes regarding **supportshow** output	
Information about the new chassis		
	New factory serial number	
	New serial number (if available)	

1. Open a Telnet session and log in to the Brocade DCX 8510-4 as **admin**. The default password is **password**. Enable the logging function on your Telnet or serial console connection.

2. Back up the current configuration.

   NOTE
   If you are using the Virtual Fabric feature, you should run **configupload -vf** before running the **configupload** command to save the logical switch configuration.

   - Enter **configUpload -all**; then enter the requested information at the prompts.

     This command uploads the Brocade DCX 8510-4 configuration to the customer-defined FTP server, making it available for downloading. For more information about this command, refer to the *Fabric OS Command Reference*.

     ```
     switch:admin> configupload
     Protocol (scp or ftp) [ftp]: ftp
     Server Name or IP Address [host]: 123.123.123.123
     User Name [user]: Admin24
     File Name [config.txt]: config-switch0.txt
     Password:
     Upload complete
     switch:admin>
     ```

   - Alternatively, you can save the configuration file to a Brocade USB device.

3. Record the WWN value: Enter **wwn**; then copy the command output into a file named config-miscinfo.txt.

   ```
   switch:admin> wwn
   10:00:00:60:69:00:00:0a
   ```

4. Record the IP address information.

   Enter **ipAddrShow -sw**; then copy the command output into the config-miscinfo.txt file.

   ```
   switch:admin> ipaddrshow -sw

   SWITCH
   Ethernet IP Address: 10.32.50.12
   Ethernet Subnetmask: 255.55.0.0
   Fibre Channel IP Address: 1.2.3.4
   Fibre Channel Subnetmask: 255.255.255.0

   CP0
   Ethernet IP Address: 10.32.50.10
   Ethernet Subnetmask: 255.55.0.0
   HostName : cp0
   Gateway Address: 10.32.40.1

   CP1
   Ethernet IP Address: 10.32.50.11
   Ethernet Subnetmask: 255.55.0.0
   HostName : cp1
   Gateway Address: 10.32.40.1

   Backplane IP address of CP0 : 10.0.0.6
   Backplane IP address of CP1 : 10.0.0.7
   switch:admin>switch:admin>
   ```

5. Display and record the manufacturer serial numbers.

   Enter **chassisShow**; then copy the command output into the config-miscinfo.txt file.

   "Factory Serial Num" and "Serial Num" are listed under "Chassis/WWN Unit 1." If the current WWN cards are the original cards, the factory serial number listed is the same as the chassis serial number.

   ```
   switch:admin> chassisshow

   Chassis Backplane Revision: 1F

   SW BLADE  Slot: 1
   Header Version:         2
   Power Consume Factor:   -50
   Factory Part Num:       60-0001532-03
   Factory Serial Num:     KP000000195
   Manufacture:            Day:  1  Month:  1  Year: 2007
   Update:                 Day: 14  Month:  3  Year: 2012
   Time Alive:             187 days
   Time Awake:             3 days

   <output truncated>

   CHASSIS/WWN  Unit: 1    (in same assembly as WWN Unit: 2)
   Header Version:         2
   Power Consume Factor:   -3
   Factory Part Num:       60-0001501-07
   Factory Serial Num:     FT02X805BE2
   Manufacture:            Day: 26  Month:  3  Year: 2007
   Update:                 Day: 14  Month:  3  Year: 2009
   Time Alive:             207 days
   Time Awake:             3 days

   <output truncated>

   switch:admin>
   ```

6. Create a SAN "profile" by entering and recording the information provided by the following commands:

   - **nsShow**
   - **nsAllShow**
   - **switchShow -qsfp**
   - **fabricShow**

   Copy the command output into a text file named "SANbefor.txt." After the Brocade DCX 8510-4 is restored to the fabric, this information can be used to verify that no unintentional changes have occurred to the fabric.

   ```
   switch:admin> nsshow
   Enter Pid COS PortName NodeName TTL
   <output truncated>

   switch:admin> nsallshow
   12 Nx_Ports in the Fabric
   <output truncated>

   switch:admin> switchshow
   ```

```
switchName: switch
<output truncated>

switch:admin> fabricshow
Switch ID Worldwide Name Enet IP Addr FC IP Addr Name
<output truncated>

switch:admin>
```

7. Enter **supportShow**; then copy the command output into a text file named "spptshow.txt."

> **NOTE**
> The **supportShow** command has a very long output and time for completion. It may last 20 minutes or longer depending on the size of the SAN.

This file provides a backup of all the information that might be required by Technical Support. The information can be used after the Brocade DCX 8510-4 is restored to the fabric to verify that no unintentional changes have occurred to the fabric.

```
switch:admin> supportshow
version: 7.0.0
<output truncated>

switch:admin>
```

8. Record the cable connections between the Brocade DCX 8510-4 and the target device and ports.

9. Run **supportSave** on the active CP. The information recorded can be very important in case you have difficulties during the replacement process.

Disconnecting from the network and fabric

Complete the following steps to disconnect the chassis from the network.

1. Shut down the Brocade DCX 8510-4 using the **sysShutdown** command on the active CP.

```
switch:admin> sysshutdown
This command will shutdown the operating systems on your switch.
You are required to power-cycle the switch in order to restore operation.
Are you sure you want to shutdown the switch [y/n]?y
HA is disabled
Stopping blade 1
Shutting down the blade....
Stopping blade 2
Shutting down the blade....
Stopping blade 8
Shutting down the blade....

Broadcast message from root (pts/1) Tue Jul 18 14:23:06 2008...
```

```
The system is going down for system halt NOW !!
```

DANGER

Turn off the power switches and disconnect the power cords (D006)

2. Power off the chassis by flipping all AC power switches to the off position. (The power supply status LED should turn off.)

3. Remove the power cords from the power supplies and the power outlets.

4. Remove the chassis door.

5. Label the cables connected to all blades and record the connections.

6. Disconnect the cables from the SFP+ transceivers in the application and port blades and set them aside. If you have mSFP transceivers in FC8-64 port blades, remove the transceivers and cables together and set them aside. The SFP+ transceivers can be left in the port blades or removed.

7. Disconnect all cables from the control processor and core switchblades.

8. Disconnect any ICL or QSFP cables.

Removing components from the chassis

ATTENTION
Follow ESD precautions ("ESD precautions").

1. Remove the chassis door ("Chassis door removal and replacement") if not already done.

2. Remove the cable management fingers ("Vertical cable management fingers removal and replacement").

3. Remove the port, application, and encryption blades or filler panels ("Port, application, and encryption blade removal and replacement" and "Blade filler panel removal and replacement").

4. Remove the core switch blades (CR16-4) ("Core switch blade (CR16-4) removal and replacement").

5. Remove the control processor blades (CP8) ("Control processor blade (CP8) removal and replacement").

6. Remove the power supplies or filler panels ("Power supply removal and replacement").

7. Remove the blower assemblies ("Blower assembly removal and replacement").

8. Remove the WWN bezel (logo plate) and WWN cards ("WWN card removal and replacement").

Installing the replacement chassis

Complete the following steps to install the replacement chassis.

CAUTION

Use safe lifting practices when moving the product. (C015)

ATTENTION
A completely empty Brocade DCX 8510-4 chassis weighs approximately 25.4 kg (56 lb) and requires a hydraulic or assisted lift to install it.

NOTE
If the Brocade DCX 8510-4 is installed in a cabinet, ensure that the cabinet is balanced and secured mechanically and that the removal and installation procedure will not compromise cabinet stability.

1. If the chassis is in a cabinet, remove it from the cabinet.

2. Place the chassis on a lift or on the shipping pallet provided with the original chassis.

3. Unpack the new chassis:

   a. Cut the bands that encircle the packaging.

   b. Remove the lid and the kits and foam from the top of the chassis.

   c. Lift the cardboard box off the chassis and remove the plastic bag from around the chassis. Save the packing materials for use when returning the old chassis.

   d. Leave the chassis on top of the plastic shipping tray if the chassis must be transported to the installation location.

   NOTE
   The Brocade DCX 8510-4 packaging does not incorporate a wood pallet and pallet brackets. The chassis sits on top of a plastic shipping tray.

4. Use a pallet jack or other assisted lift to transport the new chassis to the installation area. Doorways must be wider than 91 cm (36 in.) to accommodate the chassis on the pallet.

5. Use a lift to raise the chassis to the correct level. If installing the chassis in a cabinet, follow the instructions provided by the rack kit manufacturer.

Installing components into the new chassis

ATTENTION
Follow ESD precautions ("ESD precautions").

1. Replace the WWN bezel (logo plate) and WWN cards ("WWN card removal and replacement").

2. Replace the blower assemblies ("Blower assembly removal and replacement").

3. Replace the power supplies or filler panels ("Power supply removal and replacement").

4. Replace the control processor blades (CP8) ("Control processor blade (CP8) removal and replacement").

5. Replace the core switch blades (CR16-4) (“Core switch blade (CR16-4) removal and replacement”).

6. If ICL cables are not used, insert rubber plugs in the QSFP transceivers if installed in the core switch blades (CR16-4).

7. Replace the blades or filler panels (“Port, application, and encryption blade removal and replacement” and “Blade filler panel removal and replacement”).

8. Replace the cable management fingers (“Vertical cable management fingers removal and replacement”).

9. Connect the power cords to the power supplies and the power outlets.

10. Replace the chassis door (“Chassis door removal and replacement”).

11. Power on the Brocade DCX 8510-4 (“Providing power to the Brocade DCX 8510-4”).

    The Brocade DCX 8510-4 performs a power-on self-test (POST). The POST takes a minimum of three minutes and is complete when LED activity returns to standard state.

12. Verify that the Brocade DCX 8510-4 is powered on and POST is complete (all power LED indicators on the blades should be a steady green).

13. Verify that all components are functioning correctly by checking their LEDs. If the LEDs do not indicate correct operation, try reinstalling the corresponding component.

Downloading the configuration

Once the chassis and its various components have been reassembled and powered back on, use the **configDownload** command to restore the original configuration. The **configDownload** command can be entered through a Telnet or serial session, but the Brocade DCX 8510-4 must have an Ethernet connection to the server name or IP address of the host for the download process to complete. For more information, refer to the **help configdownload** command or the *Fabric OS Command Reference*.

Complete the following steps to download the configuration.

1. Log in to the Brocade DCX 8510-4 as **admin**.

```
switch:admin> login
login: admin
password: xxxxxxxx
switch:admin>
```

NOTE
If you are using the Virtual Fabric feature, you must run **configdownload -vf** before running the **configdownload** command to restore the logical switch configuration.

2. Enter the **chassisDisable** command.

3. Enter the **configDownload** command.

```
switch:admin> configdownload -all
Server Name or IP Address [host]: 123.123.123.123
User Name [None]: Admin24
File Name [config.txt]: config-switch.txt
Password: xxxxxxxx
download complete
switch:admin>
```

4. Reboot the Brocade DCX 8510-4.

Verifying correct operation of the system

Complete the following steps to verify the correct operation of the Brocade DCX 8510-4.

1. Log in to the Brocade DCX 8510-4 as **admin**.

```
switch:admin> login
login: admin
password: xxxxxxxx
switch:admin>
```

2. Enter the **slotShow -m** command and verify that all the installed cards are detected and that their status is operational (enabled).

```
switch:admin> slotShow -m

Slot    Blade Type    ID     Model Name     Status
--------------------------------------------------
  1      SW BLADE     97     FC16-32        ENABLED
  2      SW BLADE     77     FC8-64         ENABLED
  3      CORE BLADE   99     CR16-4         ENABLED
  4      CP BLADE     50     CP8            ENABLED
  5      CP BLADE     50     CP8            ENABLED
  6      CORE BLADE   99     CR16-4         ENABLED
  7      SW BLADE     96     FC16-48        ENABLED
  8      SW BLADE     77     FC8-64         ENABLED

switch:admin>
```

3. Verify that the Brocade DCX 8510-4 is functioning correctly by entering **switchShow** or **switchStatusShow**.

   This **switchShow** command displays the Brocade DCX 8510-4 and port status information.

```
DCX-4_130:admin> switchshow
switchName:     DCX-4_130
switchType:     121.3
switchState:    Online
switchMode:     Native
switchRole:     Principal
switchDomain:   130
switchId:       fffc82
switchWwn:      10:00:00:05:33:03:2c:00
zoning:         ON (ZONE_CONFIG_NAME)
switchBeacon:   OFF
FC Router:      ON
FC Router BB Fabric ID: 10
Address Mode:   0

Index Slot Port Address Media  Speed  State        Proto
======================================================
   0    1    0   820000   id     N8    Online      FC  F-Port
10:00:00:05:1e:f8:a0:b4
```

```
   1    1    1    820100   id    N8    Online      FC   F-Port
10:00:00:05:33:26:0e:65
   2    1    2    820200   id    N8    Online      FC   F-Port
10:00:00:05:33:48:5e:f5
   3    1    3    820300   id    N8    Online      FC   F-Port
10:00:00:05:1e:f8:a0:b3

(output truncated)
```

4. Verify that all the IP address information is correct by entering **ipAddrShow** and checking the results against the IP information recorded in the config-miscinfo.txt file.

```
switch:admin> ipaddrshow

SWITCH
Ethernet IP Address: xxx.xxx.xxx.12
Ethernet Subnetmask: 255.55.0.0
Fibre Channel IP Address: 1.2.3.4
Fibre Channel Subnetmask: 255.255.255.0

CP0
Ethernet IP Address: xxx.xxx.xxx.10
Ethernet Subnetmask: 255.55.0.0
HostName : cp0
Gateway Address: xxx.xxx.xxx.1

CP1
Ethernet IP Address: xxx.xxx.xxx.11
Ethernet Subnetmask: 255.55.0.0
HostName : cp1
Gateway Address: .1

Backplane IP address of CP0 : 10.0.0.4
Backplane IP address of CP1 : 10.0.0.5
switch:admin>switch:admin>
```

Reconnecting the system to the network and fabric

See the cable routing information recorded in Table 12 for the following steps.

Complete the following steps to reconnect the Brocade DCX 8510-4 to the network and fabric.

1. Connect the CP blades to the local area network.

    a. Insert the appropriate Ethernet cables into each Ethernet port.

    b. Connect the other ends to an Ethernet 10/100 Base-T LAN, if not already connected.

    NOTE
    The Brocade DCX 8510-4 can be accessed by remote connection using any of the available management tools, such as Telnet or Web Tools. Ensure that the Brocade DCX 8510-4 is not modified using other connections during the rest of this procedure.

2. Reconnect the transceivers and cables to the port blades:

a. Position one of the transceivers so that the key is oriented correctly to the port and insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

b. Select the cable that corresponds to the port and position it so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

c. Repeat step a and step b for the remaining ports.

d. Organize the cables as required.

Verifying correct configuration of the fabric

Copying the command outputs from this section into a file is recommended.

1. Create an "after" SAN profile by entering the following commands and copying the output to a text file named SANafter.txt:

   - **nsShow**
   - **nsAllShow**
   - **switchShow**
   - **fabricShow**
   - **lscfg –show** (if using the Virtual Fabric feature)

```
switch:admin> nsshow
Type Pid     COS      PortName NodeName TTL(sec)
 N   020f00;      3;10:00:00:01:73:00:29:46;10:00:00:01:73:00:29:46; na
    Fabric Port Name: 20:0f:00:60:69:90:03:f0
<output truncated>

switch:admin> nsallshow
{
 020f00 021fda 021fdc 021fe0 021fe1
5 Nx_Ports in the Fabric}

switch:admin> switchshow
switchName: rsl8-st03-dcx-01
<output truncated>

switch:admin> fabricshow
Switch ID Worldwide Name Enet IP Addr FC IP Addr Name
<output truncated>

switch:admin>lscfg --show
Created switches: 128(ds) 1 2(bs)
Port    0    1    2    3    4    5     6     7     8     9
-------------------------------------------------------------------
```

```
FID     1 | 1 | 1 | 1 | 1 | 128 | 128 | 128 | 128 | 128 |
<output truncated>

switch:admin>
```

2. Determine any differences between the information in the SANafter.txt file and the information in the SANbefor.txt file created earlier. In particular, look for differences in the following:

   - Device types
   - Number of devices
   - ISL and port states
   - Number of switches in the fabric

3. Resolve any issues or unintentional changes to the Brocade DCX 8510-4 or fabric:

   - If there are any mechanical problems, try reseating the associated component.
   - If the configuration information is not correct for the Brocade DCX 8510-4, modify as required.
   - If other issues exist, contact your support provider.

Cable routing table

Table 12 is a 64-port template for a cable routing table. Make copies of the table to cover the total number of ports in the Brocade DCX 8510-4.

TABLE 12 Cable routing table for Brocade DCX 8510-4 (64 ports shown)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	0				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				

TABLE 12 Cable routing table for Brocade DCX 8510-4 (64 ports shown) (Continued)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				
	36				
	37				
	38				
	39				
	40				
	41				
	42				
	43				
	44				
	45				
	46				
	47				
	48				
	49				

TABLE 12 Cable routing table for Brocade DCX 8510-4 (64 ports shown) (Continued)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		
	50				
	51				
	52				
	53				
	54				
	55				
	56				
	57				
	58				
	59				
	60				
	61				
	62				
	63				

Specifications

In this appendix

General specifications

The Brocade DCX 8510-4 is compliant with United States and International safety and Electromagnetic Compatibility (EMC) standards. Table 13 lists the general specifications for the Brocade DCX 8510-4.

TABLE 13   General specifications

Specification	Description
Configurable port types	F_Port, E_Port, EX_Port, M_Port, D_Port
System architecture	Nonblocking shared memory
System processor	FreeScale 8548, 1.2 GHz
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signalling Interface standard)
Classes of service	Class 2, Class 3, Class F (interswitch frames)
Fabric initialization	Complies with FC-SW 5.0
FC-IP (IP over Fibre Channel)	Complies with FC-IP 2.3 of the FCA profile

TABLE 13   General specifications (Continued)

Port to port latency	Local switching - 800ns (add 400ns for E_Port to E_Port); Blade to blade - 2.4 microseconds (add 400ns for E_Port to E_Port)
Switching capacity	An aggregate switching capacity of 3.36 billion frames per second (for Class 2, Class 3, and Class F frames for a 192 port chassis

System architecture

Table 14 describes the system architecture of the Brocade DCX 8510-4.

TABLE 14   System architecture

Feature	Description
Fibre Channel Ports	Up to 192 16 Gbps ports, universal (E_Port, F_Port, EX_Port, M_Port, D_Port).
Control Processor	Redundant (active/standby) control processor blades.
Scalability	Full fabric architecture: 239 switches maximum.
Performance	2.125 Gbps line speed, full duplex. 4.25 Gbps line speed, full duplex. 8.50 Gbps line speed, full duplex. 10.51875 Gbps line speed, full duplex. 16.0 Gbps line speed, full duplex. Autosensing of 2, 4, 8, and 16 Gbps port speeds depending on SFPs used. Speed matching between 2, 4, 8, and 16 Gbps port speeds. 10 Gbps port speeds with dedicated SFPs.
ISL Trunking	Automatically uses up to 4 ports in a trunk group to form a 32 Gbps trunk. Can use up to 8 ports in a trunk group to form a 64 Gbps trunk.
Aggregate bandwidth	4.1 Tbps populated with four FC16-48 port blades and using 16 ICL ports @ 64 Gbps).
Switch latency	FC8-64 blade: <2.1 µsec any port to any port at 8 Gbps, cut-through routing. FC8-32E blade: <800 ns any port to any port, 2.4 µsec blade to blade at 8 Gbps, cut-through routing. FC8-48E blade: <800 ns any port to any port, 2.4 µsec blade to blade at 8 Gbps, cut-through routing. FC16-32 blade: <800 ns any port to any port, 2.4 µsec blade to blade at 16 Gbps, cut-through routing. FC16-48 blade: <800 ns any port to any port, 2.4 µsec blade to blade at 16 Gbps, cut-through routing. FX8-24 blade - FC to FC: <2.1 µsec any port to any port at 8 Gbps, cut-through routing.
Maximum frame size	2112-byte payload.
Frame buffers	8000 per ASIC, with 5000 more that can be borrowed from neighboring ASIC if enabled.

TABLE 14   System architecture (Continued)

Feature	Description
Port types	FC8-64 supports these port types: F_Port, FL_Port, E_Port, Ex_Port, and M_Port. FC8-32E supports these port types: F_Port, E_Port, Ex_Port, and M_Port. FC8-48E supports these port types: F_Port, E_Port, Ex_Port, and M_Port. FC16-32 supports these port types: F_Port, E_Port, Ex_Port, M_Port and D_Port. FC16-48 supports these port types: F_Port, E_Port, Ex_Port, M_Port and D_Port. FS8-18 supports these port types: FL_Port, F_Port, E_Port, EX_Port, and M_Port. FX8-24 supports these port types: F_Port, FL_Port, E_Port, and Ex_Port on FC. VE_Port on GbE. **NOTE:** Self-discovery is based on switch type (U_Port) with an optional port type control.
Data traffic types	Fabric switches supporting unicast, multicast (255 groups), and broadcast.
Media types	8Gb: FC8-32E, -48E, and FS8-18 blade require Brocade hot-pluggable SFP+, LC connector; 8Gb SWL. 8Gb: FC8-64, require Brocade hot-pluggable mSFP; 8Gb SWL only. 16Gb: FC16-32 and -48, require Brocade hot-pluggable SFP+; 16Gb, 10Gb, or 8Gb SWL and LWL. 1 GbE: FX8-24 can use Brocade-branded 4Gb SFP. Core blade (CR16-4) uses Brocade-branded, hot-pluggable QSFP; 16Gb x 4 SWL only for ICL connections. Distance subject to fiber-optic cable and port speed.
Fabric Services	Advanced Performance Monitoring; Adaptive Networking (Ingress Rate Limiting, Traffic Isolation, QoS); BB credit recovery; Brocade Advanced Zoning (default zoning, port/WWN zoning, broadcast zoning); Dynamic Path Selection (DPS); Extended Fabrics; Fabric Watch; FDMI; FICON CUP; Frame Redirection; FSPF; Integrated Routing (FR4-18i SAN Extension blade not required for routing); IPFC; ISL Trunking; Management Server; N_Port Trunking; NPIV; NTP v3; Port Fencing; Registered State Change Notification (RSCN); Reliable Commit Service (RCS); Simple Name Server (SNS); syslog; Top Talkers; Virtual Fabrics (Logical Switch, Logical Fabric).
Inter-chassis link (ICL/QSFP)	Chassis-to-chassis linkage through connectors on the core switch blade (CR16-4).

System size and weight

The weight of the Brocade DCX 8510-4 can vary considerably depending on the combination of blades installed. Use Table 15 and the system FRU weights table to determine the weight of the Brocade DCX 8510-4 with your combination of port and application blades.

TABLE 15   System size and weight

System	Size or weight
Width	43.74 cm (17.22 in.)
Height	35.6 cm (14.0 in./8U) 40.0 cm (15.75 in./9U) with Port Side Exhaust Kit
Depth (without door)	61.29 cm (24.09 in.)
Depth (with door)	73.20 cm (28.82 in.)
Brocade DCX 8510-4: 192-port configuration with four FC16-48 port blades including two CP blades, 2 core switch blades. two blowers, two power supplies, and two cable management finger assemblies	68 kg (150 lb)
Empty chassis: • No blades • No CPs • No CRs • No power supplies • No blower assemblies • No cable management devices	25.4 kg (56 lb)

System blade and FRU weights

Table 16 lists the weights of the compatible blades and FRUs.

TABLE 16   System FRU weights

FRU	Weight
CP blade (CP8)	3.0 kg (6.6 lb)
CR blade (CR16-4)	3.3 kg (7.3 lb)
FC8-64 port blade	3.36 kg (7.4 lb) without media
FC8-32E port blade	2.8 kg (6.2 lb) without media
FC8-48E port blade	3.3 kg (7.3 lb) without media
FC16-32 port blade	2.8 kg (6.2 lb) without media
FC16-48 port blade	3.3 kg (7.3 lb) without media
FS8-18 encryption blade	5.5 kg (12.0 lb) without media
FX8-24 extension blade	4.2 kg (9.2 lb) without media
Port card filler panel	1.5 kg (3.2 lb)
Power supply	2.45 kg (5.4 lb)
Blower assembly	5.73 kg (12.6 lb)
WWN bezel	0.3 kg (0.6 lb)

TABLE 16   System FRU weights (Continued)

FRU	Weight
Cable management device	0.45 kg (1.0 lb)
Chassis door	2.09 kg (4.6 lb)

Facility requirements

The facility where the Brocade DCX 8510-4 is in use must meet the following requirements to provide for correct operation:

- Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the chassis nameplate.
- The environmental specifications listed in Environmental requirements.
- The power specifications listed in Power specifications.

Furthermore, if the Brocade DCX 8510-4 will be installed in an EIA rack, ensure the following:

- All equipment installed in the rack has a reliable branch circuit ground connection, and does not rely on a connection to a branch circuit, such as a power strip.
- The rack is balanced and mechanically secured to provide stability in the event of an earthquake.
- Additional equipment does not exceed the rack's weight limits.

Environmental requirements

Table 17 lists the environmental operating ranges for the Brocade DCX 8510-4. The requirements for non-operating conditions are also provided for acceptable storage and transportation environments.

TABLE 17   Environmental requirements

Condition	Acceptable range during operation	Acceptable range during nonoperation
Ambient temperature	0° to 40° C outside switch (32° to 104° F)	-25° to $+70^{\circ}$ C outside switch (-13° to 158° F)
Humidity	5% to 85% RH noncondensing, at 40° Celsius, with maximum gradient of 10% per hour	10% to 90% RH noncondensing, at 70° Celsius
Altitude	Up to 3 km (10,000 ft.) above sea level	0 to 12 km (40,000 ft.) above sea level
Shock	20G, 6ms duration, half-sine wave	33G, 11ms duration, half-sine wave
Vibration	0.5G p-p, 5-500 Hz at 1.0 octave/minute	2.0G p-p, 5-500 Hz at 1.0 octave/minute

TABLE 17   Environmental requirements (Continued)

Condition	Acceptable range during operation	Acceptable range during nonoperation
Airflow	250 cu ft/min. (425 cu m/hr)	None required
Heat dissipation (fully loaded with QSFPs)	1195 Watts or 4078 BTU/hr (192 port configuration)	Not applicable

NOTE
The 0° to 40° Celsius range applies to the ambient air temperature at the air intake vents on the nonport side of the Brocade DCX 8510-4.

The temperature inside the Brocade DCX 8510-4 can be up to 75° Celsius during operation. If the internal temperature range exceeds the operating ranges of the components, the LEDs, error messages, and Fabric Watch alerts will indicate a problem. Use the **tempShow** command or Fabric Watch commands to view temperature status.

Fibre Channel port specifications

The Fibre Channel ports in the Brocade DCX 8510-4 support full duplex link speeds at 2, 4, 8, 10, or 16 Gbps inbound and outbound, automatically negotiating to the highest common speed of all devices connected to the port.

The ports are compatible with optical SWL (short wavelength: approximately 850 nm), optical LWL (long wavelength: approximately 1310 nm), and optical ELWL (extended long wavelength: approximately 1550 nm) laser transmitter SFPs, SFP+s, mSFPs (FC8-64 only), and XFPs (FC10-6 only). The strength of the signal is determined by the type of SFP, SFP+, mSFP or XFP in use. mSFPs support only SWL.

QSFP ports are fixed speed 16 Gbps ports designed to be used with specialized quad (4x16) connections and cables. They support only SWL.

The ports are universal and self-configuring, capable of becoming F_Ports (fabric ports), FL_Ports (fabric loop-enabled ports), or E_Ports (expansion ports).

The ports meet all required safety standards. For a listing of these standards, see “Regulatory compliance”.

Power specifications

The power subsystem is a redundant +48V DC power distribution system with a provision for up to two 2000-watt, 48V DC bulk power supplies. Two bulk power supplies produce the intermediate distribution voltage in the distributed power system.

If circuits are available, 200-240 VAC (220 VAC nominal) is always recommended as a greener and more efficient alternative.

NOTE
If any of the following intelligent blades are used, 200-240 VAC is required:
FS8-18, FX8-24.

Table 18 shows the basic power specifications for each power supply.

TABLE 18   Power specifications

Specification	Value
Input voltage	Range: 85-264 VAC Auto-volt, Nominal: 100-240 VAC.
Input frequency	Range: 47-63 Hz; Nominal: 50-60 Hz.
Inrush current	Limited to 60A peak for any initial current surge or spike of 10ms or less at either cold or warm start. Any additional inrush current surges or spikes in the form of AC cycles or multiple AC cycles greater than 10ms, and less than 150ms, must not exceed 15A peak.
Power supply output (each)	Low line (85-132 VAC), 1000W; High line (180-264 VAC), 2000W.

The power requirements for a given configuration depend on which blades have been installed in the chassis. Table 19 shows the power draw for the blades that can be used in the Brocade DCX 8510-4 chassis along with the power draw for the cooling fans.

All numbers for the blades assume that the blade is fully populated with optical transceivers, including QSFPs for the core blades. All ports are Fibre Channel except where noted.

You can calculate your power requirements by combining the power draws for the various blades and fan units in your configuration. While you may use fewer ports in a given blade, it is always safer to use the power requirement of a fully populated blade.

TABLE 19   Power demands per component

Blade or fan units	Maximum Power Draw (Watts)	Type of Blade	Ports per blade	Number of blades permitted in chassis	Total ports per chassis
CP8	40	Control blade	NA	2	NA
CR16-4	135	Core blade	8 64 Gbps QSFP ports	2	16 quad ports (64 ports)
FC8-32E (8Gb)	140	Port blade	32 8 Gbps SFP+	up to 4	128
FC8-48E (8Gb)	160.4	Port blade	48 8 Gbps SFP+	up to 4	192
FC16-32 (16Gb)	140	Port blade	32 16 Gbps SFP+ -can use 8 Gbps SFP+	up to 4	128
FC16-48 (16Gb)	160.4	Port blade	48 16 Gbps SFP+ -can use 8 Gbps SFP+	up to 4	192
FC8-64 (8Gb)	126.4	Port blade	64 8Gbps SFP+	up to 4	256
FS8-18	235	Encryption blade	16 8 Gbps SFP+	up to 4	64

TABLE 19   Power demands per component (Continued)

Blade or fan units	Maximum Power Draw (Watts)	Type of Blade	Ports per blade	Number of blades permitted in chassis	Total ports per chassis
FX8-24	250	Extension blade	12 8 Gbps SFP+ 10 1 Gbps Ethernet 2 10 Gbps Ethernet	up to 4	48 8 Gbps 40 1 Gbps Ethernet 8 10 Gbps Ethernet
Fan unit	90	NA	NA	2 fans per chassis	NA

Power supply redundancy is key to your installation, so any demand must be met with twice the capacity. See Table 20 for power supply requirements for specific demand ranges.

TABLE 20   Power supply requirements

Demand	power supplies @ 110 VAC (nominal)	power supplies @ 220 VAC (nominal)
up to 1000W	2	2
1000W-2000W	NA - cannot achieve redundancy	2
greater than 2000W	NA - cannot achieve redundancy	NA - cannot achieve redundancy

In addition to these tables, you can consult the power tables in the latest update of the Fabric OS Release Notes.
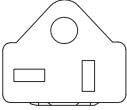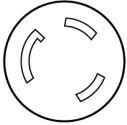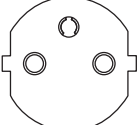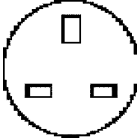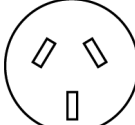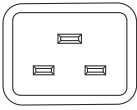
Power cords

The types of power cords provided with the Brocade DCX 8510-4 are specific to the country where it is installed. For each of the types of power cords in Table 21, the end that connects to the Brocade DCX 8510-4 has an IEC 60320/C19 cable connector. The AC power receptacles on each power supply are equipped with IEC 60320/C20 power connectors.

In order to connect to a power strip already installed in a cabinet, the C20, 20A-250V, 12 AWG power cord is required.
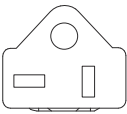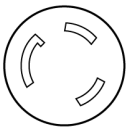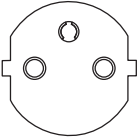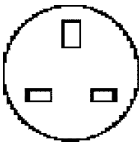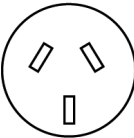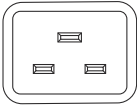
To order a power cord, contact your Brocade DCX 8510-4 supplier.

TABLE 21   Power cord types (international)

Country	Plug style						
	NEMA 5-20P 125V only USA, Canada, Mexico, other locations	NEMA L6-20 USA, Canada, Mexico, other locations	CEE-7/7 "Schuko" Continental Europe	BS-1363A	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230V~	C20 20A-250V 12 AWG connect to in-cabinet power strip only All locations
Argentina						X	X
Australia					X		X
Austria			X				X
Bahrain				X			X
Belgium			X				X
Brazil	X	X					X
Chile			X				X
China, People's Rep.					X		X
Czech, Rep. of			X				X
Denmark						X	X
Egypt						X	X
England						X	X
Finland						X	X
France			X				X
Germany			X				X
Greece			X				X
Hong Kong				X			X
Hungary				X			X
India						X	X
Indonesia			X				X
Ireland, North				X			X
Ireland, South				X			X
Israel				X			X
Italy						X	X
Japan	X	X					X
Korea, South			X				X

TABLE 21   Power cord types (international) (Continued)

Country	Plug style						
	NEMA 5-20P 125V only USA, Canada, Mexico, other locations	NEMA L6-20 USA, Canada, Mexico, other locations	CEE-7/7 "Schuko" Continental Europe	BS-1363A	AS 3112 Australia/New Zealand	IEC-60309 32A-6h, 230V~	C20 20A-250V 12 AWG connect to in-cabinet power strip only All locations
Malaysia			Alternate			Recommended	X
Mexico	X	X					X
Monaco			X				X
Netherlands			X				X
New Zealand					X		X
Norway						X	X
Poland			X				X
Portugal			X				X
Puerto Rico	X	X					X
Russia			X				X
Saudi Arabia			X				X
Scotland						X	X
Singapore				X			X
South Africa				X			X
Spain			X				X
Sweden						X	X
Switzerland						X	X
Taiwan	X	X					X
Turkey			X				X
United Arab Emirate			X				X
United Kingdom						X	X
United States	X	X					X
Venezuela	X	X					X
Yugoslavia			X				X

Power cord notice

⚠ **CAUTION**

This switch might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing.

Power cord notice (Japan DENAN)

注意 – 添付の電源コードを他の装置や用途に
使用しない
添付の電源コードは本装置に接続し、使用する
ことを目的として設計され、その安全性が確認
されているものです。決して他の装置や用途に
使用しないでください。火災や感電の原因とな
る恐れがあります。

ATTENTION
Never use the power cord packed with your equipment for other products.

Data transmission ranges

Table 22 provides the data transmission ranges for different transceivers, port speeds, and cable types.

NOTE
There is no LWL or ELWL version of either the mSFP or QSFP transceiver.

TABLE 22   Supported optics, speeds, cables, and distances

Transceiver type	Form factor	Speed	Multimode media (62.5 microns) (OM1)	Multimode media (50 microns) (OM2)	Multimode media (50 microns) (OM3)	Multimode media (50 microns) (OM4)	Single Mode Media (9 microns)
SWL	mSFP/SFP+	2 Gbps	150 m (492 ft.)	300 m (984 ft.)	500 m (1640 ft.)	N/A	N/A
	mSFP/SFP+	4 Gbps	70 m (229 ft.)	150 m (492 ft.)	380 m (1264 ft.)	400 m (1312 ft.)	N/A
	mSFP/SFP+	8 Gbps	21 m (68 ft.)	50 m (164 ft.)	150 m (492 ft.)	190 m (623 ft.)	N/A
	SFP+	10 Gbps	33 m (108 ft.)	82 m (269 ft.)	300 m (984 ft.)	550 m (1804 ft.)	N/A
	mSFP/SFP+	16 Gbps	15m (49 ft.)	35 m (115 ft.)	100 m (328ft.)	125 m (410 ft.)	N/A
	QSFP	4 x 16Gbps	N/A	50 m (164 ft.)	N/A	N/A	N/A
LWL	SFP+	2 Gbps	N/A	N/A	N/A	N/A	30 km (18.6 mi.)
	SFP+	4 Gbps	N/A	N/A	N/A	N/A	30 km (18.6 mi.)
	SFP+	8 Gbps	N/A	N/A	N/A	N/A	10 km (6.2 mi.) or 40 km (24.8 mi.)
	SFP+	10 Gbps	N/A	N/A	N/A	N/A	10 km (6.2 mi.)
	SFP+	16 Gbps	N/A	N/A	N/A	N/A	10 km (6.2 mi.)

Qualified cables for the FC8-64 port blade

Table 23 lists the third party cables that have been qualified for use with the mSFP transceivers in the FC8-64 high density port blade.

TABLE 23   Qualified cables for mSFP connections for the FC8-64 high density port blade

Description	Length	Corning part number	Molex part number	Amphenol part number
Patch cables - mSFP to LC		S50502S5120XXXM (XXX = length)		943-99865-1XXXX (XXXX = length)
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	1 m	S50502S5120001M	106273-0525	943-99865-10001
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	2 m	S50502S5120002M	106273-0526	943-99865-10002
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	3 m	S50502S5120003M	106273-0527	943-99865-10003
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	5 m	S50502S5120005M	106273-0528	943-99865-10005
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	10 m	S50502S5120010M	106273-0529	943-99865-10010
Patch cables - mSFP to mSFP		S5S502S5120XXXM (XXX = length)		943-99866-1XXXX (XXXX = length)
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	1 m	S5S502S5120001M	106273-0560	943-99866-10001

TABLE 23   Qualified cables for mSFP connections for the FC8-64 high density port blade

Description	Length	Corning part number	Molex part number	Amphenol part number
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	2 m	S5S502S5120002M	106273-0561	943-99866-10002
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	3 m	S5S502S5120003M	106273-0562	943-99866-10003
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	5 m	S5S502S5120005M	106273-0563	943-99866-10005
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	10 m	S5S502S5120010M	106273-0564	943-99866-10010
Trunk cables - mSFP to MTP	tbd			
mSFP LC - MTP-female, 12 fiber, 12" breakout, OM3, 50/125		H93S5TE9-BMU-XXXM (XXX = length)		943-99867-1XXXX (XXXX = length)
mSFP LC - MTP-female, 12 fiber, 6" breakout, OM3, 50/125	2m		106272-0327	
mSFP LC - MTP-female, 24 fiber, 12" breakout, OM3, 50/125	2m		106272-0328	
Bag of clips (quantity 64)		TRIGGER-BP-NP	n/a	n/a

Safety notices

When using this product, observe the danger, caution, and attention notices in this manual. The notices are accompanied by symbols that represent the severity of the safety condition.

NOTE
Translated safety notices are in the *Brocade Product Safety Notices* publication, which is available on *http://my.brocade.com* under documentation>product manuals>Brocade DCX Backbones.

The danger and caution notices are listed in numerical order based on their IDs, which are displayed in parentheses, for example (D004), at the end of each notice. Use this ID to locate the translations of these danger and caution notices in the *Brocade Product Safety Notices*.

Regulatory compliance

This section describes the regulatory compliance requirements for the Brocade DCX 8510-4. It contains the following standards:

- *"FCC warning (US only)"* on page 122
- *"KCC statement (Republic of Korea)"* on page 122
- *"VCCI statement (Japan)"* on page 122

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

KCC statement (Republic of Korea)

A급 기기 (업무용 방송통신기기): 이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Class A device (Broadcasting Communication Device for Office Use): This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

VCCI statement (Japan)

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective action.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるように要求されることがあります。

BSMI statement (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

Warning:

This is Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

CE statement

This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on the product contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

* Electromagnetic Compatibility (EMC) Directive 2004/108EEC
* Low Voltage Directive (LVD) 73/23/EEC and the Complementary Directive 93/68/EEC
* EN55022:2006 (European Emissions Requirements)
* EN55024:1998, +A1:2001 and +A2:2003 (European Immunity Requirements)
* EN61000-3-2:2006/JEIDA (European and Japanese Harmonics Spec)
* EN61000-3-3:1995, +A1:2001 and +A2:2005

Canadian requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

German statement

Maschinenlärminformations-Verordnung – 3 GPSGV, der höchste Schalldruckpegel beträgt 70.0 dB(A) gemäss EN ISO 7779.

Machine noise information regulation – 3. GPSGV, the highest sound pressure level value is 70.0 dB(A) in accordance with EN ISO 7779.

Laser compliance

This equipment contains Class 1 laser products and complies with FDA Radiation Performance Standards, 21 CFR Subchapter I and the international laser safety standard IEC 825-2.

Use only optical transceivers that are qualified by Brocade Communications Systems, Inc. and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 825-2. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

Regulatory compliance standards

Table 24 lists the regulatory compliance standards for which the Brocade DCX 8510-4 is certified.

TABLE 24   Regulatory compliance standards

Country	Standards		Agency Certifications and Markings	
	Safety	EMC	Safety	EMC
United States	Bi-Nat UL/CSA 60950-1 2nd Ed or latest	ANSI C63.4	cCSAus	FCC Class A and Statement
Canada	Bi-Nat UL/CSA 60950-1 2nd Ed or latest	ICES-003 Class A	cCSAus	ICES A and Statement
Japan		CISPR22 and JEIDA (Harmonics)		VCCI-A and Statement
European Union	EN60950-1 2nd Ed or latest	EN55022 and EN55024	TUV-GS, N	CE marking
Australia, New Zealand		EN55022 or CISPR22 or AS/NZS CISPR22		C-Tick mark
Argentina	IEC60950-1 2nd Ed or latest		"S" mark	
Russia	IEC60950-1 2nd Ed or latest	51318.22-99 and 51318.24-99 or latest	GOST mark	GOST mark
Korea		KN22 and KN24		KC mark Class A
China (PS only)	GB4943-2001 and GB9254-1998 or latest	GB17625.1-2003 or latest	CQC logo	CQC logo
Taiwan (PS only)	CNS 14336(94) or latest	CNS 13438(95) or latest	BSMI mark	BSMI mark

Environmental regulation compliance

This section describes the China RoHS environmental regulatory compliance requirements for the Brocade DCX 8510-4.

China RoHS

The contents included in this section are per the requirements of the People's Republic of China-Management Methods for Controlling Pollution by Electronic Information products.

遵守环境法规
中国 **RoHS**
本节中包含的内容都遵守了中华人民共和国《电子信息产品污染控制管理办法》的要求。

Environmental Protection Use Period (EPUP) Disclaimer

In no event do the EPUP logos shown on the product and FRUs alter or expand that warranty that Brocade provides with respect to its products as set forth in the applicable contract between Brocade and its customer. Brocade hereby disclaims all other warranties and representations with respect to the information contained on this CD including the implied warranties of merchantability, fitness for a particular purposes and non-infringement.

The EPUP assumes that the product will be used under normal conditions in accordance with the operating manual of the product.

环保使用期限 **(EPUP)** 免责声明：
EPUP 标志不会出现在产品和 FRU 的改装产品中，也不会对 Brocade 所提供的相关产品保修条款（该保修条款在 Brocade 及其客户间达成的适用合同中列出）进行增补。对于此 CD 上包含的相关信息，如适销性、针对特定用途的适用性和非侵权性的暗示保证，Brocade 在此郑重声明本公司对于与上述信息相关的所有其他保证和陈述概不负责。
EPUP 假设在"产品操作手册"中注明的常规条件下使用该产品。

China RoHS hazardous substances/toxic substances (HS/TS) concentration chart

In accordance with China's Management Measures on the Control of Pollution caused by Electronic Information products (Decree No. 39 by the Ministry of Information Industry), the following information is provided regarding the names and concentration level of hazardous substances (HS) which may be contained in this product.

有毒有害物质或元素名称及含量标识
Toxic / Hazardous Substances and Elements Table

部件名称	有毒有害物质或元素					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬 (Cr(VI))	多溴联苯（PBB）	多溴二苯醚（PBDE）
光纤通道交换机 Fiber Channel Switch	✕	O	O	O	O	O
风扇/冷却组装件 Fan, Blower Assemblies	✕	O	O	O	O	O
线路板部件 PCBA Cards	✕	O	O	O	O	O
主机总线适配 (HBA) Host Bus Adapter (HBA)	✕	O	O	O	O	O
USB 闪存器 USB Flash Drive	O	O	O	O	O	O
电源 Power Supply Kit	✕	O	O	O	O	O
光纤模块 ㉒ SFP Optics	✕	O	O	O	O	O
钣金件 Sheet Metal	✕	O	O	O	O	O
机箱部件 Chassis Assembly	✕	O	O	O	O	O
机械支架及滑轨 Mechanical Brackets & Slides	✕	O	O	O	O	O
插槽填充物 Slot Filler	✕	O	O	O	O	O
电缆整理盘 Cable Management Tray	✕	O	O	O	O	O
梳状线缆 Cable Comb	✕	O	O	O	O	O
线束及电源线 Cables and Power Cords	O	O	O	O	O	O
替换门 Replacement Doors	✕	O	O	O	O	O
电池 Battery	O	O	O	O	O	O
软件/文档光盘 Software/Documentation CDs	O	O	O	O	O	O

O：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363—2006规定的限量要求以下。

○: Indicates that the content of the toxic and hazardous substance in all the homogeneous materials of the part is below the concentration limit requirement as described in SJ/T 11363-2006.

✕：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363—2006规定的限量要求。

✕: Indicates that the content of the toxic and hazardous substance in at least one homogeneous material of the part exceeds the concentration limit requirement as described in SJ/T 11363-2006.

A   Environmental regulation compliance

Application and Encryption Blades

In this appendix

Introduction

This appendix provides details about the application and encryption blades that are available optionally for the Brocade DCX 8510-4. Contact your Brocade DCX 8510-4 supplier for additional information.

FS8-18 blade

The FS8-18 encryption blade is a high performance 16 port auto-sensing blade with data cryptographic (encryption/decryption) and data compression capabilities designed for enterprises to secure their data against theft or unauthorized use and to compress tape data for maximum utilization of tape media. The encryption blade is a network-based solution that secures data-at-rest for heterogeneous tape drives, disk array LUNs, and virtual tape libraries.

The FS8-18 blade provides the following major features:

- 16 auto-sensing F, FL, E, EX, and M ports at 8 Gbps FC ports
- 16 SFP media interfaces
- Encryption engines
- Key management/generation
- Key management with these hardware interfaces:
    - Two 1000Base copper type media interfaces
    - One smart card interface
- Security supervisor tamper detection and response capability
- CC (Common Criteria) EAL-3 compliant

FX8-24 blade

The FX8-24 blade has 12 external Fibre Channel (FC) SFP ports supporting the Fibre Channel Routing Services and 10 external 1 Gigabit Ethernet (GbE or GE) SFP ports supporting the Fibre Channel Over IP (FCIP) feature. There are also 2 licensable external 10 Gigabit Ethernet (10GbE or 10GE) SFP ports supporting FCIP. It operates with the Brocade Fabric Operating System and can communicate with another FX8-24 or a Brocade 7800 for both Fibre Channel Routing Services and FCIP, or a Brocade AP7420 for Fibre Channel Routing Services.The GbE ports on the FX8-24 are NOT compatible with the GbE ports on the FR4-18i blade or the Brocade 7500 switch.

NOTE
The port diagram on the front panel uses the abbreviations GE for 1 GbE ports and 10GE for 10 GbE ports.

⚠ **CAUTION**

The 10 GbE SFPs used in the FX8-24 blade and the 10 Gbps FC SFPs used in the FC16-32/48 blades are NOT interchangeable.

The FX8-24 operates in one of three modes: 1) ten 1GbE ports, 2) ten 1GbE ports and one 10 GbE port, or 3) two 10 GbE ports depending on licensing and subsequent configuration of GbE port mode. If operating in 10GbE mode the other end of the circuit must also be an FX8-24 operating in either 10GbE mode or dual mode with the corresponding VE_ports in 10GbE mode. All GbE ports on the blade can be configured to work with either copper or optical SFPs.

The FX8-24 blade is intended as a platform for FCIP and Fibre Channel Routing Services. Refer to the *Fabric OS Administrator's Guide* for information on configuring these features.

The FX8-24 blade provides the following hardware features:

- 12 autosensing FC ports with link speeds of 1, 2, 4 or 8 Gbps.
- Ten GbE ports supporting FCIP with fixed link speed at 1 Gbps:
- Two 10 GbE ports (licensable) supporting FCIP with fixed link speed at 10 Gbps.

The FX8-24 blade also provides the following functionality features:

- FCIP.
- Compression (on FC frames before FCIP encapsulation).
- FC Routing (licensable).
- FCIP Trunking (licensable) with network-based failure recovery (failover only) and load balancing.
- Multiple circuits per trunk.
  - Four per trunk through the GbE ports.
  - Ten per trunk through the 10 GbE ports.
- SO-TCP with reorder resistance.
- FastWrite over FCIP.
- Tape pipelining over FCIP.
- FICON XRC emulation and tape pipelining over FCIP (licensable).
- FICON CUP (licensable).

- Virtual E_ports.

- FCIP QoS.

- Support for 200 ms RTT (on a limited number of GbE ports).

- Adaptive Rate Limiting (licensable).

- TCP performance graphing in Web Tools.

- FCIP Tunnels.

  - A maximum of 10 FCIP Tunnels for all GbE ports.

  - Four tunnels maximum per GbE port.

  - Two 10 GbE ports can support up to ten FCIP tunnels each.

  - Each FCIP tunnel is represented and managed as a virtual Fibre Channel E_Port.

  - Fibre Channel Routing Services can be used over the FCIP link.

  - The Link Cost is equal to the sum of all established/low metric (or currently active) circuits' MAX rates in the tunnel.

  - Fabrics connected through FCIP merge if the ports are configured as VE_Ports, and do not merge if they are configured as VEX_Ports. If VE_Ports are used in a Fibre Channel Routing Services backbone fabric configuration, then the backbone fabric merges, but the EX_Port-attached edge fabrics do not merge. For more information refer to the *Fabric OS Administrator's Guide*.

- Up to three FC trunking groups. The three groups are defined as:

  - Trunk group 0: FC ports 0,1

  - Trunk group 1: FC ports 6,7

  - Trunk group 2: FC ports 2,3,4,5,8,9,10,11

B FX8-24 blade

Diagnostics and Troubleshooting

In this appendix

Introduction

For information about troubleshooting the entire fabric, refer to the *Fabric OS Troubleshooting and Diagnostics Guide.*

The Brocade DCX 8510-4 includes a number of diagnostic aids to assist with troubleshooting, including LEDs on the hardware, commands that display current status, diagnostic tests for hardware and software, and error messages. In addition, a number of managing and monitoring features are available, such as Fabric Manager, Web Tools, Fabric Watch, and Advanced Performance Monitoring.

If the Brocade DCX 8510-4 does not operate as expected, the following steps can be taken to diagnose the problem:

- Check the LEDs and see the LED tables (Chapter 4, "Monitoring System Components") for interpretation and recommended actions.

- Review the results of the last POST run by the Brocade DCX 8510-4 ("Interpreting POST and boot results").

- Review the error logs. (Refer to the *Fabric OS Troubleshooting and Diagnostics Guide* for more information).

  - Review RASlog entries.

  - Type the **sensorShow** command to determine the status of the hardware components.

  - Run diagnostic tests ("Diagnostics").

  - Reboot the Brocade DCX 8510-4 or power the entire chassis off and then on ("Powering off the Brocade DCX 8510-4" and "Providing power to the Brocade DCX 8510-4").

If the problem is still unresolved after these steps, contact your support provider. The information required by your support provider is listed under "Getting technical help."

Obtaining chassis and component status

The CLI commands in Table 25 provide status and environmental information about the chassis and its components. These commands provide information only, and they do not interrupt traffic flow. For more information about these commands, refer to the *Fabric OS Command Reference.*

TABLE 25   Environmental status and maintenance commands

Command	Information displayed
sensorShow	Temperature readings for the port blades
	Temperature readings for the CP blades
	Status and RPM of all operational fans
	Status of all operational power supplies
tempShow	Temperature readings for the port blades
	Temperature readings for the CP blades
psShow	Status of all operational power supplies
fanShow	Status and RPM of all operational fans
chassisShow	Serial number, time awake, and additional information about each component
slotShow	Slot occupancy
errShow errDump	System error log. Refer to the *Fabric OS Message Reference* for more information on the messages in this log.

Interpreting POST and boot results

The Brocade DCX 8510-4 performs Power On Self Test (POST) by default each time the chassis is powered on, rebooted, or reset. The Brocade DCX 8510-4 can be rebooted using the **reboot** (to reboot each CP individually) or **fastBoot** commands. The **fastBoot** command reboots the switches without running POST. If the active CP blade is rebooted, it fails over to the standby CP blade.

POST

The Brocade DCX 8510-4 automatically performs POST each time it is powered on or reset.

To verify that POST has completed without error:

- Verify that all LEDs return to a normal state after POST completes.

  If one or more LEDs do not return to a normal state, and this is not due to the Brocade DCX 8510-4 being set to beacon, refer to the relevant LED table to identify and correct the problem. For port blades, and CP and core switch blades, the **slotShow** command can be used to check the status of the slots. For information about turning beaconing on/off, refer to the *Fabric OS Administrator's Guide*.

- Verify that the switch prompt displays when POST completes.

  If it does not display, POST was not successfully completed. Contact the Brocade DCX 8510-4 supplier for support.

- Review the system error log using the **errShow** or **errDump** commands.

  Any errors detected during POST are written to the system log, which is accessible through the **errShow** command. For information about error messages, refer to the *Fabric OS Message Reference*.

POST includes the following steps:

1. Preliminary POST diagnostics are run.

2. Operating system is initialized.

3. Hardware is initialized.

4. Diagnostic tests are run on several functions, including circuitry, port functionality, ability to send and receive frames, all aspects of memory, parity, statistics counters, and serialization.

Boot

In addition to POST, boot includes the following steps after POST is complete:

1. Universal port configuration is performed.

2. Links are initialized.

3. Fabric is analyzed. If any ports are connected to other switches, the Brocade DCX 8510-4 participates in a fabric configuration.

4. The Brocade DCX 8510-4 obtains a domain ID and assigns port addresses.

5. Unicast routing tables are constructed.

6. Normal port operation is enabled.

Diagnostics

Diagnostic tests are automatically run during POST to check the status of the Brocade DCX 8510-4. Any error messages generated during POST are sent to the error logs and to the serial console, if connected.

Diagnostic tests can also be run manually to test and troubleshoot the hardware and the firmware, including internal connections and circuitry, transceivers, and port cables. However, diagnostic tests are generally intended for use by support personnel.

NOTE
Error messages do not necessarily indicate that the Brocade DCX 8510-4 requires maintenance.

Each diagnostic test can be implemented by entering the related command through a Telnet or serial session. For a list of diagnostic tests and commands, refer to the *Fabric OS Administrator's Guide.*

All diagnostic tests are run at all supported link speeds. They might temporarily lock the transmit and receive speeds to a specific speed. Some diagnostic tests require interconnecting the ports to each other or using loopback plugs. If ports are interconnected, the media (cables and transceivers) at each end of the connection must be of the same type. For example, short wavelength media must be connected to short wavelength media, and likewise with long wavelength media and copper media.

For more information about diagnostic tests and how to run them, refer to the *Fabric OS Administrator's Guide* and the *Fabric OS Command Reference*. For information about system error messages (**errShow** or **errDump**), refer to the *Fabric OS Troubleshooting and Diagnostics Guide*.

Troubleshooting

Table 26 provides a list of issues, possible causes, and recommended actions.

TABLE 26   Troubleshooting the Brocade DCX 8510-4

Issue	Possible cause	Recommended action
Entire chassis powers off automatically.	Power supplies are inadequate to support the installed components.	Add an additional power supply.
Several or all components are not operating.	One or both power cables may not be connected to a live source.	Ensure that both power cables are connected to live outlets.
	One or both AC power switches might be off.	Ensure that both AC power switches are on (AC switches light up green when on).
Serial connection is faulty or serial port logs have incorrect or missing information.	Serial cable is not connected correctly.	Ensure that the cable is firmly connected to workstation computer and to the Brocade DCX 8510-4.
	Terminal emulator application parameters are not set correctly.	Ensure that the terminal emulator application is configured as follows: 9600 bits per second, 8 databits, no parity, 1 stop bit, no flow control.
	Serial port might be incompatible (only RS-232 is supported).	Ensure that the Brocade DCX 8510-4 is connected to an RS-232 port. RS-423 serial ports might experience difficulties due to corner-case incompatibilities of the standards.
	Pins on the serial cable or serial port might be damaged.	Remove the cable and inspect the pins on the cable and in the serial port. Do not reinstall if the pins on either component have any visible damage, as this could damage the pins on the other component. Replace the components as required.
CP Ethernet link speed is different than expected or a link cannot be established.	There might be a conflict with the CP Ethernet link speed negotiation set up by the network.	Specify the CP Ethernet link speed by typing the **ifModeSet** command. For more information about Ethernet connectivity to the Brocade DCX 8510-4, refer to the LAN guidelines provided through the MyBrocade Web site.
Configuration data is inaccurate or cannot be accessed.	Chassis was powered off/on while an WWN card was uninstalled or failed.	Install an operational WWN card and power the system off/on again.
	The Brocade DCX 8510-4 was rebooted while an WWN card was uninstalled or failed.	

TABLE 26   Troubleshooting the Brocade DCX 8510-4 (Continued)

Issue	Possible cause	Recommended action
Initial set up results in IP address/Domain ID conflict.	The Brocade DCX 8510-4 was connected to the fabric before being configured.	See the *Fabric OS Administrator's Guide* for configuration information.
LEDs on one or more components are changing rapidly or do not indicate a healthy state.	The Brocade DCX 8510-4 might be booting or running POST.	Verify that boot and POST are complete. The Brocade DCX 8510-4 requires a minimum of 3 minutes, usually, after power-on to complete POST.
	Beaconing might be on for the entire Brocade DCX 8510-4 or for individual components.	Determine whether beaconing is on by typing the **switchShow** command and determine whether switch beaconing or blade beaconing are on.
	Individual components might have failed.	See the LED tables in Chapter 4, Monitor System Components for interpretation and recommended actions.
	Pins on the components might be damaged.	Remove the component from the chassis and inspect the pins on the component and inside the chassis. Do not reinstall if pins on either component are damaged, as this could damage pins on other components. Replace the parts as required.
None of the LEDs on a component are on.	Component might not be seated correctly.	Ensure that the Brocade DCX 8510-4 has power and the component is firmly seated. If the problem continues, enter the **sensorShow** command to determine the component status. If the component is a CP blade or port blade, enter the **slotShow** command to determine the status.
	Component might have failed.	Replace the component as necessary.
CP blades are failing over frequently.	There is excessive serial port activity.	Ensure that the serial port activity remains below specified amount.
	CP blade is attached to an Ethernet with high traffic loads.	Ensure that the Ethernet traffic remains below specified amount
	Chassis is overheated.	Enter the **tempshow** and **sensorShow** commands to check internal temperature. If components are overheating, shut down port blades as necessary to return the temperature to operating range. Also try moving the blades in the chassis since it is possible that airflow might not be adequate to cool everything in certain configurations.

TABLE 26   Troubleshooting the Brocade DCX 8510-4 (Continued)

Issue	Possible cause	Recommended action
One or more port blades have either shut down or failed POST as indicated by the error log.	Blades might be overheated.	Enter the **sensorShow** command to check the internal temperature readings. If components are overheating, shut down port blades as necessary to return the temperature readings to the operating ranges. Also try moving the blades in the chassis since it is possible that airflow might not be adequate to cool everything in certain configurations.
	Blades might be faulty.	Enter the **slotShow** command to determine status. For more information, enter the **diagDisablePost** command; then, use the **slotPowerOff [slot number]** and **slotPowerOn [slot number]** command. Resolve the source of the problem or replace the blade as required.
	Pins on the blade or the backplane might be damaged.	Remove the blade from the chassis and inspect the pins on the blade and on the backplane inside the slot. Do not reinstall if the pins on either component are damaged, as this could damage pins on other components. Replace the components as required.
An individual component is not operating as expected.	Component may not have power or may not be firmly seated.	Ensure that the component is receiving power (power LED should be on) and the component is firmly seated.
	Pins on the component or the backplane might be damaged.	Remove the component from the chassis and inspect the pins on the blade and inside the chassis. Do not reinstall if the pins on either component are damaged, as this could damage pins on other components. Replace parts as required.
	The component might have failed.	Enter the **tempshow** and **sensorShow** command to determine the component status. If the component is a CP blade or port blade, enter the **slotShow** command to determine the status. Replace the component as necessary

Port Numbering Template

Print or copy the following templates in this appendix and use them to document the port numbering pattern for the Brocade DCX 8510-4. These templates show the following blades:

- FC16-4 core blade (Figure 36)
- FC8-64 high density port blade (Figure 37)
- FC8-32E high density port blade (Figure 38)
- FC8-48E high density port blade (Figure 39)
- FC16-32 high density port blade (Figure 40)
- FC16-48 high density port blade (Figure 41)
- FS8-18 encryption blade (Figure 42)
- FX8-24 extension blade (Figure 43)
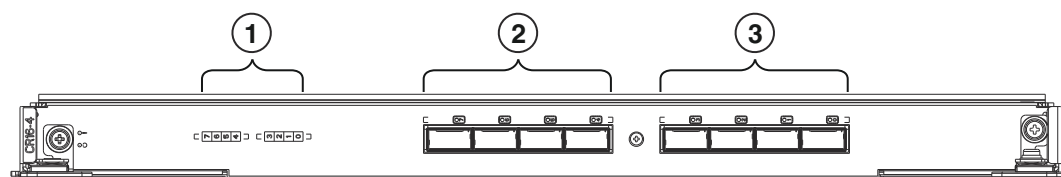
| 1 | Port map | 3 | QSFP ports 0-3 (right to left) |
| 2 | QSFP ports 4-7 (right to left) | | |

FIGURE 36   CR16-4 core blade

The follow shows the mappings from the numbered ports on the face of the core blade to the port mappings as shown by the **slotShow** command. Each external port maps to four actual ports. The CR16-4 core blade has external ports 0 through 7 only.

TABLE 27   External port to **slotShow** port mapping for core blades

External port number	slotShow port numbers	External port number	slotShow port numbers
0	0-3	8	32-35
1	4-7	9	36-39
2	8-11	10	40-43
3	12-15	11	44-47
4	16-19	12	48-51
5	20-23	13	52-55
6	24-27	14	56-59
7	28-31	15	60-63
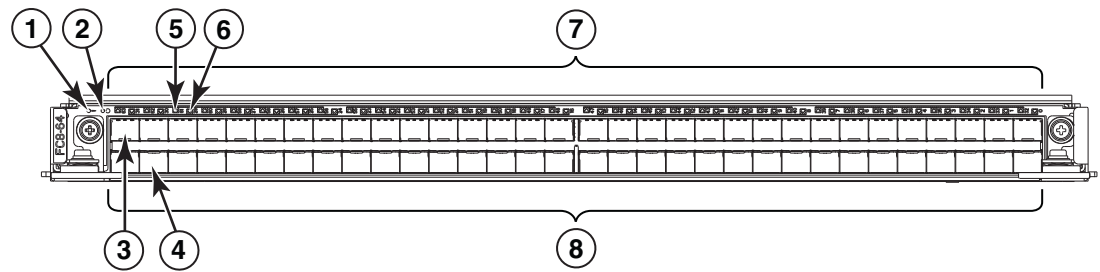
1	Blade Status LED	5	Port 61 LED
2	Blade Power LED	6	Port 29 LED
3	Port 63	7	FC ports 32-63 (bottom to top)
4	Port 30	8	FC ports 0-31 (bottom to top)

FIGURE 37   FC8-64 port blade
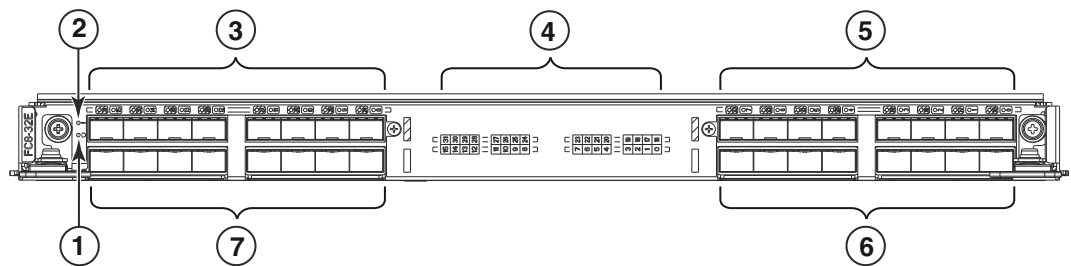
1	Blade Power LED	5	FC ports 16-23
2	Blade Status LED	6	FC ports 0-7
3	FC ports 24-31	7	FC ports 8-15
4	Port and trunking group map		

FIGURE 38   FC8-32E port blade
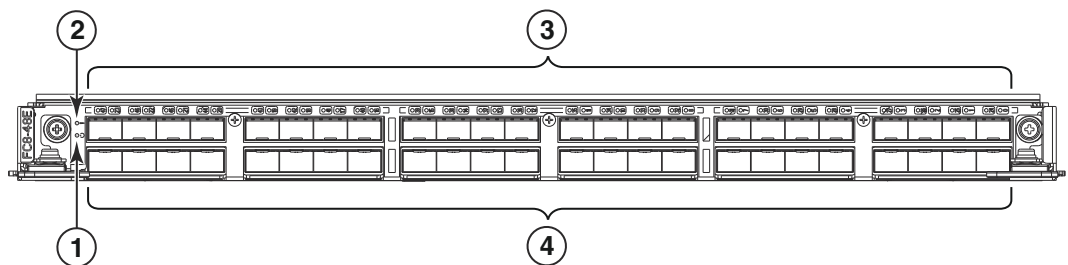
| 1 | Blade Power LED | 3 | FC ports 24-47 |
| 2 | Blade Status LED | 4 | FC ports 0-23 |

FIGURE 39   FC8-48E port blade
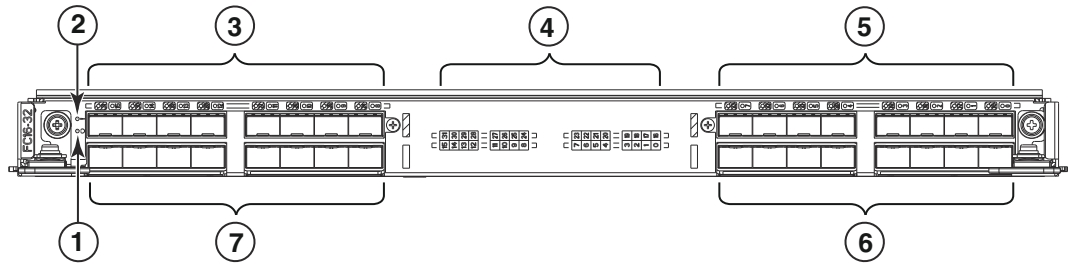
1	Blade Power LED	5	FC ports 16-23
2	Blade Status LED	6	FC ports 0-7
3	FC ports 24-31	7	FC ports 8-15
4	Port and trunking group map		

FIGURE 40   FC16-32 port blade
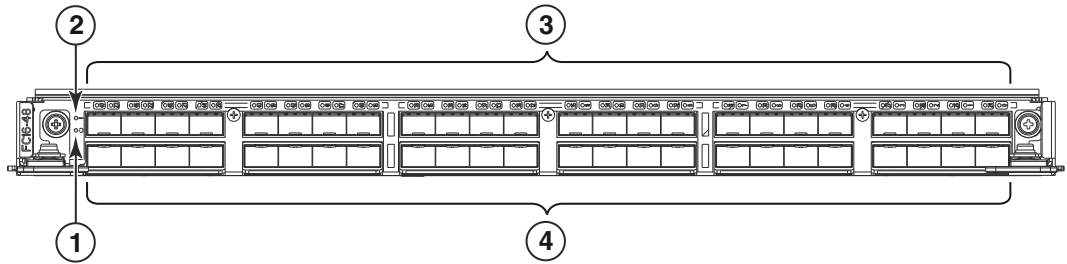
| 1 | Blade Power LED | 3 | FC ports 24-47 |
| 2 | Blade Status LED | 4 | FC ports 0-23 |

FIGURE 41   FC16-48 port blade
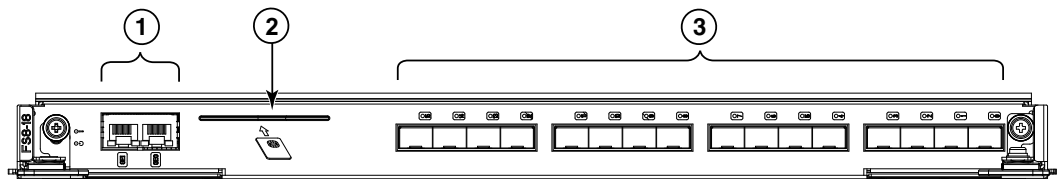
| 1 | Gigabit Ethernet ports GE0-GE1 | 3 | Fibre Channel ports 0-15 |
| 2 | Smart card port | | |

FIGURE 42   FS8-18 encryption blade

1	10 GbE ports 0-1	5	FC ports 0-5
2	1 GbE ports 0-3	6	Blade Power LED
3	1 GbE ports 4-9	7	Blade Status LED
4	FC ports 6-11		
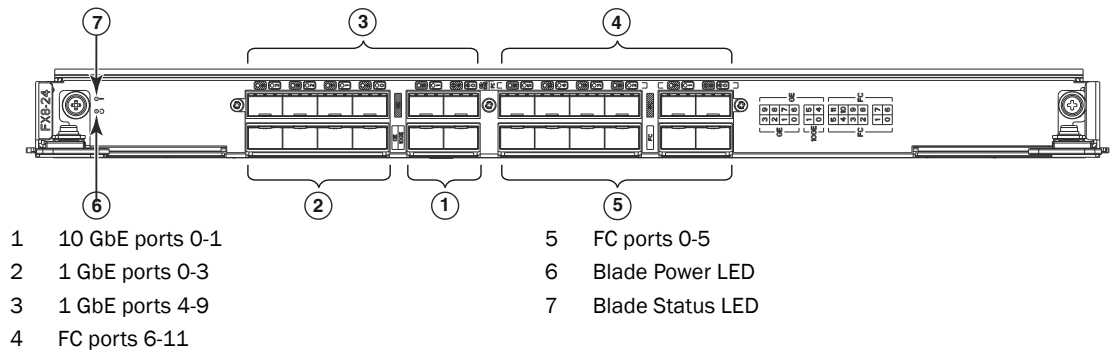
FIGURE 43 FX8-24 extension blade

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